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Ont. " Power Commission
H

(Ninth) Annual Report

OF THE

HYDRO-ELECTRIC POWER COMMISSION

OF THE

PROVINCE OF ONTARIO

FOR THE YEAR ENDED OCTOBER 31st

1916

VOLUME I.

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO:

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1917

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TORONTO



To His Honour, COLONEL SIR JOHN HENDRIE, K.C.M.G., C.V.O.,

Lieutenant-Governor of Ontario.

MAY IT PLEASE YOUR HONOUR:

The undersigned has the honour to present to Your Honour the Ninth Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1916.

Respectfully submitted,

ADAM BECK,

Chairman.

TORONTO, ONT., February 17th, 1917.

COLONEL SIR ADAM BECK, K.B., LL.D.,

*Chairman, Hydro-Electric Power Commission,
Toronto, Ont.*

SIR,—I have the honour to transmit herewith the Ninth Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1916.

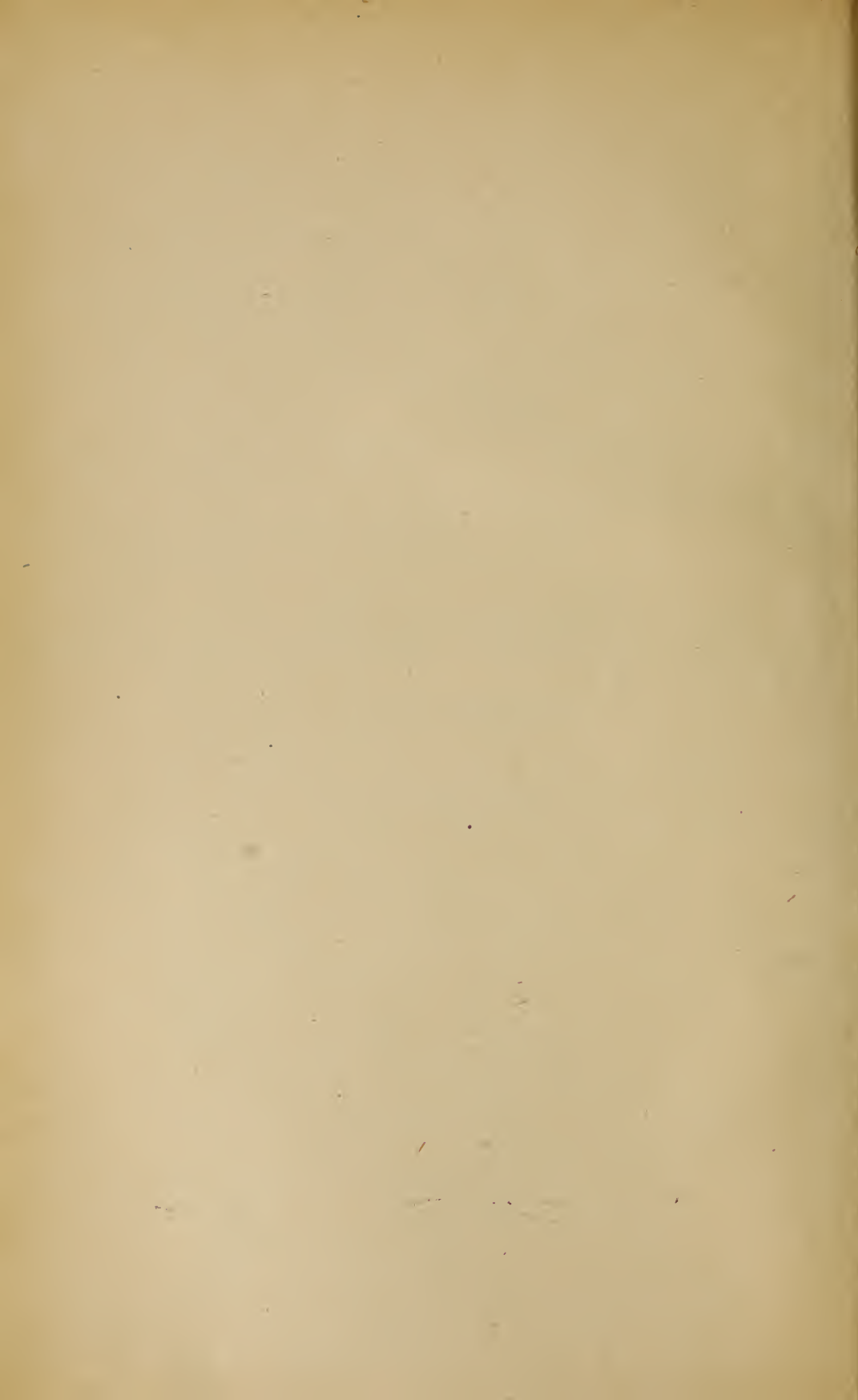
I have the honour to be,

Sir,

Your obedient servant,

W. W. POPE,

Secretary.



HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

COLONEL SIR ADAM BECK, K.B., LL.D., London, Chairman.

HON. I. B. LUCAS, M.P.P., Markdale, Commissioner.

COL. W. K. McNAUGHT, C.M.G., Toronto, Commissioner.

W. W. POPE, Secretary.

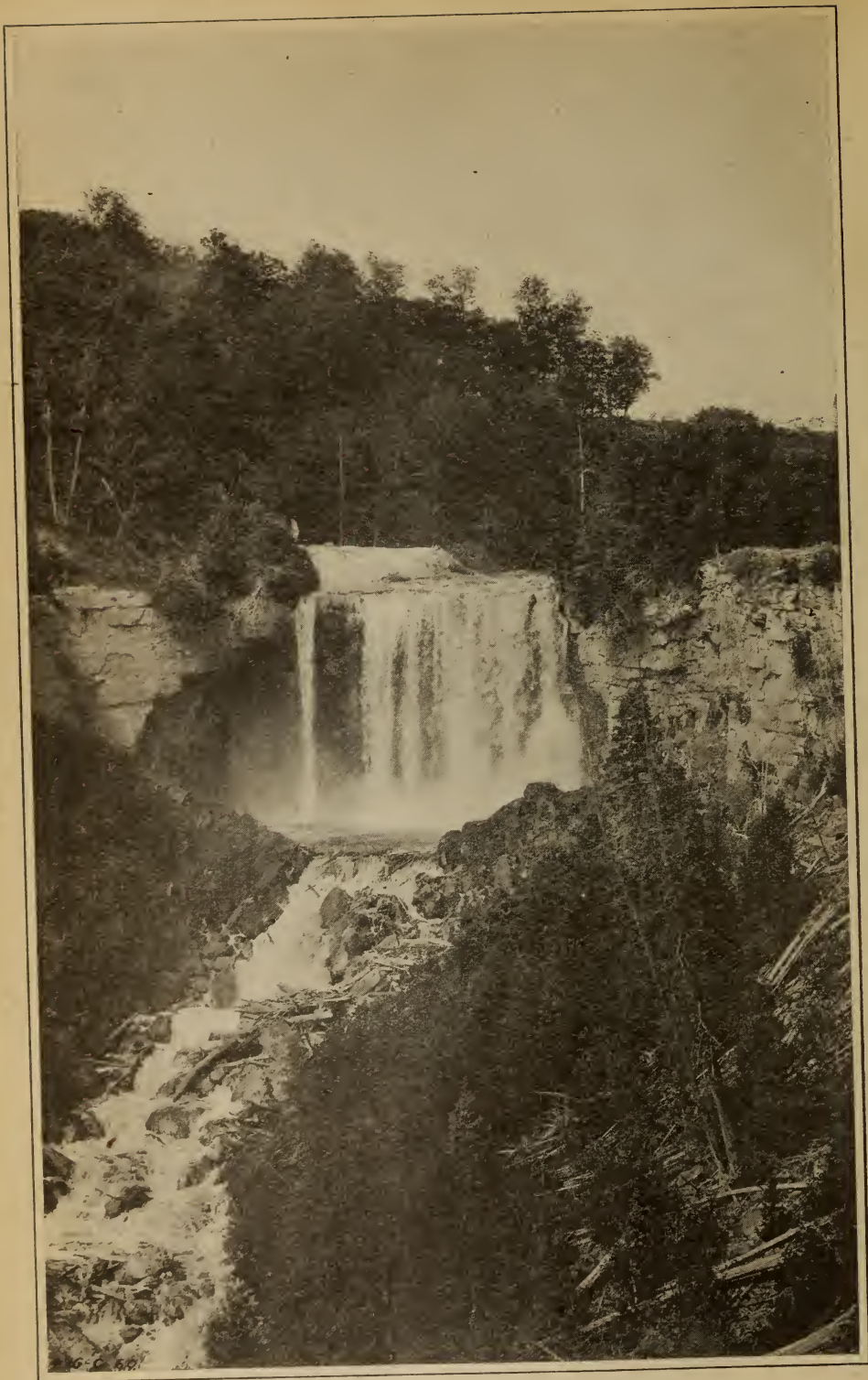
F. A. GABY, Chief Engineer.

CONTENTS

Section.	Page
I. Legal Proceedings	1
A. Acts	1
B. Right of Way	94
C. Crossings	94
D. Agreements	94
II. Transmission Systems	95
A. Steel Tower Transmission Lines	95
B. Station Equipment and Building Department	95
C. Low Tension Transmission Lines	123
III. Operation of the Systems	140
A. Niagara System	140
B. Severn System	146
C. Eugenia System	148
D. Wasdell System	150
E. Parallel Operation of the Severn, Eugenia and Wasdell Systems.....	151
F. Central Ontario System	151
G. Muskoka System	153
H. Port Arthur System	154
I. St. Lawrence System	155
J. Capital Cost	156
K. Provincial Expenditures	158
L. Balance Sheet	159
IV. Municipal Work	160
A. Municipal Advices	160
B. Municipal Electrical Inspection	184
C. Municipal Purchases and Sales	185
D. Rural Power	187
E. Ornamental Street Lighting	189
F. Municipal Underground Construction	191
G. Electric Railway Projects	191
H. Testing and Research Laboratories	194
I. General Engineering	201

ILLUSTRATIONS

Eugenia Falls	<i>Frontispiece</i>
	FACING PAGE
Main Entrance Hall—Administration Building	96
Interior of Board Room—Administration Building	96
Diagram of Stations—Niagara System	98
Diagram of Stations—Central Ontario System	100
Diagram of Stations—Severn, Eugenia, Wasdell and St. Lawrence Systems	112
Curve Showing Monthly Increase of Power Load of Municipalities—Niagara System	140
Typical Daily Load Curves—Severn, Eugenia and Wasdell Generating Stations Operating in Parellel—October, 1916	150
Curve Showing Weekly System Peaks—Central Ontario System, 1916	152
St. Thomas—Street Lighting System	190
Hydro-Electric Radial Railway Map	192
Cement and Sand Testing Equipment at the Laboratory	194
18" Integrating Sphere Photometer, Lamp Testing Laboratory	194
Curves of Candle Power Distribution of a Gas Filled Lamp Equipped with Pris- matic Refractor	196
Curves Showing Variation of Candle Power and Efficiency of a Tungsten Lamp with Life	196
Electrical Standards Laboratory	198
High Tension Test—Transformer Flashing over String of Four Suspension Insulators—Voltage 260,000	198
Testing Machines—Strength of Materials Laboratory	198
Gasoline Driven Standby Fire Pump, Stratford Municipal Waterworks	202
Elevated Water Tower at Stratford Municipal Waterworks	204



Eugenia Falls

NINTH ANNUAL REPORT

OF THE

Hydro-Electric Power Commission

SECTION I

LEGAL PROCEEDINGS

ACTS

The following Act to amend *The Power Commission Act* and to confirm certain by-laws and contracts was passed by the Legislature of the Province of Ontario during the Session of 1916.

An Act to amend *The Power Commission Act* and to confirm Certain By-laws and Contracts.

Assented to 27th April, 1916.

HIS MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This Act may be cited as "*The Power Commission Act, 1916.*" Short title.
2. Subsection 2 of section 6 of *The Power Commission Act* is amended by striking out all the words therein after the words "Lieutenant-Governor in Council" in the third line. Rev. Stat.
c. 39, s. 6,
subs. 2,
amended.
3. Section 6 of *The Power Commission Act* is amended by adding thereto the following subsections:— Rev. Stat.
c. 39, s. 6,
amended.
 - (3) Such salaries and remuneration and the travelling and other expenses of the persons appointed or employed by the Commission, as well as any other expenses of the Commission, shall be apportioned by the Commission among, and shall be chargeable to the various works and undertakings carried on by the Commission upon which such persons are employed, but any portion of such salaries or other remuneration and travelling and other expenses which are not properly chargeable to such works or undertakings and which are earned or incurred in the performance of work or services other than those rendered in respect of works or undertakings of the Commission under contract with municipal corporations shall be chargeable and payable out of such moneys as may be appropriated for that purpose by the Legislature. Apportionment of salaries and expenses of officers.

Apportionment to be final.

- (4) The apportionment by the Commission of such salaries or other remuneration and travelling and other expenses shall be final.

Commencement of section.

- (5) The provisions of this section shall take effect as from the 1st day of January, 1910.

Rev. Stat. c. 39, amended.

4. *The Power Commission Act* is amended by adding the following section:—

Appointment of Comptroller.

- 6a.—(1) The Lieutenant-Governor in Council may appoint an officer to be known as the Comptroller of the Commission who shall hold office during the pleasure of the Lieutenant-Governor in Council and shall countersign every cheque issued by the Commission, but before countersigning shall satisfy himself that the issue of the cheque is authorized.

Books and accounts.

- (2) The Comptroller shall give such directions as he may deem proper as to the books of account kept by the Commission and shall cause to be kept and entered therein regular accounts according to a system and method approved of from time to time by the Lieutenant-Governor in Council of all sums of money received and paid out by the Commission and of the several purposes for which the same are received and paid, and such books shall be at all times open to the inspection of any person appointed by the Lieutenant-Governor in Council for that purpose, and any such person may take copies or extracts from such books.

Annual financial report.

- (3) The Commission, through the Comptroller, shall, before the 15th day of February in each year, make to the Treasurer of Ontario an annual report for the information of the Lieutenant-Governor in Council and for the information of the Assembly, and such report shall contain, among other things, clear and comprehensive statements disclosing and exhibiting—

- (a) The actual condition as to the amount and character of the assets and liabilities (direct and indirect) of the undertakings conducted by it as on 31st December last preceding;
- (b) The cash transactions, including receipts and disbursements for the year ending on 31st December last preceding;
- (c) The revenues, income and interest earned and the amount of the costs, expenses and other items chargeable there against in connection with the operation, maintenance, administration and conduct of the under-

takings controlled by it for the year ending 31st December last preceding;

- (d) The amounts, with the expected sources of the same, which it is estimated will be received in cash or its equivalent and the payments, loans and advances with the purpose of the same, which it is contemplated shall be made in cash or otherwise, in the next succeeding year;
- (e) The amounts and particulars of the obligations and liabilities which it is contemplated shall be incurred in the next succeeding year;
- (f) The securities or evidence of indebtedness which it is contemplated shall be created, issued, sold or otherwise disposed of, together with the method of dealing with the same in the next succeeding year;

and such other matters as may appear to be of public interest in relation to the said Commission or its works, as the Lieutenant-Governor in Council may direct, and such statements shall be in form approved of by the Treasurer of Ontario, and shall contain such information and particulars as he shall require, and shall be certified by the chairman or vice-chairman as true and correct in all particulars.

- (4) The Comptroller shall make such other and further reports, and prepare and furnish such other statements to the Treasurer of Ontario as he shall from time to time request or direct. ^{Other returns by Comptroller.}
- (5) In case of the illness or absence of the Comptroller or a vacancy in the office, the Lieutenant-Governor in Council may appoint some other person to act as Comptroller; and the person so appointed shall, during such absence or vacancy, possess the powers and perform the duties of the Comptroller.
- (6) The accounts of the Commission shall, upon the direction of the Lieutenant-Governor in Council, be from time to time, and at least once every year, audited either by the Auditor for Ontario, or by other auditor or auditors.
- (7) The salary of the Comptroller and the expenses of such audits shall be fixed by the Lieutenant-Governor in Council and shall be payable out of such moneys as may be appropriated for the purposes of the Commission by the Legislature, as part of the costs of the administration.

Appoint-
ment of
sole arbi-
trator in
lieu of
Rev. Stat.
cc. 35, 39
and 4 Geo.
V. c. 31.

5. —(1) In lieu of the provisions contained in *The Ontario Public Works Act*, *The Power Commission Act*, and *The Hydro-Electric Railway Act, 1914*, with respect to the appointment of arbitrators where land or other property is taken or injured by the Commission in the doing of any work under the authority of any of the said Acts, the Chief Justice of the Supreme Court of Ontario, upon the request of the Lieutenant-Governor in Council, may nominate some person who, in his opinion, is skilled in the valuing of real property, and upon such nomination being approved by the Lieutenant-Governor in Council and until such approval is revoked the person so nominated shall become and be the sole arbitrator for the purpose of any arbitration proceedings taken under any of the said Acts to which the Commission is a party, but in all other respects the provisions of the said Acts, including those relating to appeals, shall apply.

Determin-
ing compen-
sation be-
fore sole
arbitrator is
appointed.

(2) Until such nomination is made and approved and after such approval is revoked and until another nomination has been made and approved, the compensation to be paid to any person whose property may be taken or injured by the Commission, shall be determined in the same manner as heretofore.

Rev. Stat.
c. 39,
amended.

6. *The Power Commission Act* is amended by adding thereto the following sections:—

Payment
over to
Commission
of moneys
appropriated.

14a. Where the Legislature has appropriated money for the purposes of the Commission, such money shall be payable out of such appropriation to the Commission from time to time, upon the requisition of the Chairman of the Commission and the direction of the Lieutenant-Governor in Council, in such amounts and at such times as shall be stated in the requisition and direction, and this section shall have effect notwithstanding that there may be sums due from the Commission to the Province and notwithstanding anything in *The Audit Act* contained.

Rev. Stat.
c. 23.

Reserve
fund.

14b. The Commission may set apart out of the moneys coming to its hands from time to time from any municipal corporation, railway company, or distributing company such sums as may be sufficient in the opinion of the Commission to provide for the renewal, reconstruction, alteration and repair of the works constructed and operated by the Commission, and to meet any unforeseen expenditure caused by the destruction or injury of any such works.

Rev. Stat.
c. 39, s. 15,
amended.

7.—(1) Section 15 of *The Power Commission Act* is amended by inserting after the word "Commission" in the first line the words "on account of sinking fund or interest."

(2) Section 15 of the said Act is amended by adding thereto the following subsection:—

- (2) The income of the Commission shall be applied to the necessary operating expenses, to the preservation, improvement, supervision, renewal, repairs, maintenance and insurance of its works, and to the payment of the remuneration and expenses of the Commissioners, and the salaries of officers and others employed by the Commission, and to other incidental expenses.

Rev. Stat.
c. 39; s. 15,
amended.

Application
of income of
Commission.

8. *The Power Commission Act* is amended by adding thereto the following section:—

Rev. Stat.
c. 39,
amended.

- 15a.—(1) The Commission may, out of any funds in its hands, from time to time purchase such electrical, hydraulic or other machinery, appliances, apparatus and furnishings as may be used in the transmission, distribution, supply or use of electrical power or energy, and may dispose of the same from time to time to municipal corporations and commissions.

Commission
may
purchase
and sell
supplies.

- (2) The Commission may undertake and carry out the installation, construction, erection or purchase of supplies for any plant, machinery, wires, poles and other things for the transmission, distribution, supply or use of electrical power or energy for light, heat or power purposes, by a municipal corporation or commission which has entered into a contract with the Commission for the supply of electrical power or energy, and the Commission may charge and collect from such corporation or commission the cost of any work done or service rendered by the Commission, its officers, servants or workmen under this subsection.

Doing work
for contract-
ing munici-
palities.

- (3) This section shall take effect as from the 31st day of October, 1910.

Commence-
ment of
section.

9. Section 18 of *The Power Commission Act* is amended by adding thereto the following subsection:—

Rev. Stat.
c. 39, sub. 8,
amended.

- (8) Where a corporation has entered into a contract with the Commission for the supply of electrical power or energy, the debentures issued for any works for the distribution and supply of such electrical power or energy by the corporation, shall not be included in ascertaining the limit of the borrowing powers of the corporation as prescribed by *The Municipal Act*.

Debentures
of contract-
ing munici-
palities not
included in
ascertaining
limit of
borrowing
powers.

Rev. Stat.
c. 192.

10. Section 37 of *The Power Commission Act*, as enacted by section 12 of *The Power Commission Act, 1915*, is repealed and the following substituted therefor:—

5 Geo. V.
c. 19, s. 12,
amended.

- 37.—(1) The Commission may, with the approval of the Lieutenant-Governor in Council, make regulations as to the design, construction, installation, protection, operation, maintenance and inspection of works, plant, machinery, apparatus,

Regulations
as to
electrical
works.

appliances, devices, material and equipment for the generation, transmission, distribution, connection and use of electrical power or energy by any municipal corporation or commission and by any railway, street railway, electric light, power or transmission company, or by any other company or individual generating, transmitting, distributing or using electric power or energy, or whose undertaking, works or premises are electrically connected with any plant for the generation, transmission or distribution of electric power or energy, and the Commission may impose penalties for the breach of any such regulations.

Order of
Commission
as to work
to be done.

- (2) The Commission may, at any time, order such work to be done in the installation, removal, alteration or protection of any of the works mentioned in subsection 1, as the Commission may deem necessary for the safety of the public, or of workmen, or for the protection of the property damaged by fire or otherwise, and pending the performance of such work, or in case of noncompliance with the regulations or with any order of the Commission, may order the supply of electrical power or energy to be cut off from such works.

Ordering
cutting off
of supply.

Inspectors
and their
duties.

- (3) The Commission may appoint inspectors for the purpose of seeing that the regulations and orders of the Commission, made under the authority of this section, or any other provision of this Act, are carried out and may collect the fees to be paid by any municipal corporation or commission, or by any company, firm, or individual under the regulations or by order of the Commission, and may provide for the payment of the remuneration, travelling and other expenses of the Inspector out of the fines and fees so collected or out of the funds appropriated for carrying on the work of the Commission.

Powers as
to entering
on property.

- (4) Every Inspector so appointed may, during any reasonable hour, enter upon, pass over or through any land, buildings or premises for the purpose of carrying out the regulations and orders of the Commission, and perform the duties assigned to him; and every municipal corporation or commission, company, firm, or individual, molesting, hindering, disturbing or interfering with an inspector in the performance of his duty, shall be guilty of an offence, and shall incur the penalty provided by subsection 7.

Duty as to
complying
with
written
order of
Commission.

- (5) Every municipal corporation or commission, and every company, firm or individual, upon receiving notice in writing by the Commission to remedy any defect or to make any alteration, or carry out any work, or comply with such notice within the time thereby prescribed, and in default, shall incur the penalty provided by subsection 7.

- (6) Every municipal corporation or commission, and every company, firm or individual, supplying electrical power or energy for use in any electric works, plant, machinery, apparatus, appliance or equipment before the same have been inspected and such supply authorized by the certificate of the Commission, and after notice from the Commission of the unauthorized supply or use, shall incur a penalty of not less than \$300 nor more than \$500. Penalty for supplying electricity before works approved.
- (7) Every municipal corporation or commission, and every company, firm and individual, refusing or neglecting to disconnect or discontinue the supply of electricity to any electric works, plant, machinery, apparatus, appliance, or equipment, upon due notice in writing from the Commission so to do, shall incur a penalty of not less than \$300 nor more than \$500. Penalty for disobeying order to discontinue supply.
- (8) Nothing in this Act shall affect the liability of any municipal corporation or commission, or of any company, firm, or individual, for damages caused to any person or property by reason of any defect in any electric works, plant, machinery, apparatus, appliance, device, material, or equipment, or in the installation or protection thereof, nor shall the Commission or any inspector incur any liability by reason of any inspection or the issue of any certificate or on account of any loss occasioned by the cutting off of the supply of electrical power or energy in accordance with the orders of the Commission. Other liability not affected.
- (9) Every municipal corporation or commission, and every company, firm or individual, disobeying the provisions of this Act, or of the regulations, or any order of the Commission, shall incur a penalty of not less than \$10 nor more than \$50, and in the event of continuing the offence, of not less than \$10 nor more than \$50 for every day during which such offence continues. Penalty for disobeying regulations.
- (10) The penalties imposed by or under the authority of this section shall be recoverable under *The Ontario Summary Convictions Act* and shall be paid over to the Commission. Recovery of penalties under Rev. Stat. c. 90.
- 11.** Section 48 of *The Power Commission Act*, as enacted by section 15 of *The Power Commission Act 1915*, is amended by adding thereto the following subsection:— 5 Geo. V. c 19, s. 15, amended.
- (4) Every member or officer of a municipal commission who contravenes any of the provisions of this section shall forfeit his office, and shall be disqualified and incapable of being elected or appointed to any such municipal commission or to any other municipal office for a period of two years, and the like Disqualification of member of municipal commission dealing in electrical supplies.

proceedings may be taken by the commission or by a ratepayer against any such member or officer to remove him from his office or declare his disqualification, as may be taken by a ratepayer for the removal or disqualification of a member of a municipal council who has become disqualified from sitting and voting therein, but the Commission shall not be required to furnish security for costs.

Relieving
municipality
from sink-
ing fund
charges.

12. Notwithstanding anything in *The Power Commission Act* contained the Commission, with the approval of the Lieutenant-Governor in Council, may relieve any municipal corporation which has entered into a contract with the Commission from the payment of any sum in the sinking fund account during the first five years of such contract, and the amount required from the corporation for sinking fund shall be payable only during the remainder of the term of the contract.

By-laws
confirmed.

13. By-laws Nos. 716 and 718 of the Corporation of the City of Niagara Falls; By-laws Nos. 486 and 491 of the Corporation of the Town of Blenheim; By-laws Nos. 10 and 11 of 1914, Nos. 7 and 11 of 1915, and No. 3 of 1916, of the Corporation of the Town of Bothwell; By-laws Nos. 576 and 612 of the Corporation of the Town of Chesley; By-laws Nos. 653 and 654 of the Corporation of the Town of Durham; By-laws Nos. P-19 and P-20 of the Corporation of the Town of Gravenhurst; By-laws Nos. 498 and 499 of the Corporation of the Town of Harriston; By-laws Nos. 658 and 659 of the Corporation of the Town of Listowel; By-laws Nos. 265 and 266 of the Corporation of the Town of Markdale; By-laws Nos. 654 and 659 of the Corporation of the Town of Mount Forest; By-laws Nos. 1,169 and 1,178 of the Corporation of the Town of Orangeville; By-laws Nos. 474 and 476 of the Corporation of the Town of Palmerston; By-laws Nos. 1,033 and 1,034 of the Corporation of the Town of Petrolia; By-laws Nos. 602, 603 and 615 of the Corporation of the Town of Ridgetown; By-laws Nos. 207 and 222 of the Corporation of the Village of Ailsa Craig; By-laws Nos. 8 and 9 of 1914 as amended by By-law No. 3 of 1916, and No. 8 of 1915, of the Corporation of the Village of Chatsworth; By-laws Nos. 292 and 294 of the Corporation of the Village of Dutton; By-laws Nos. 254 and 257 of the Corporation of the Village of Dundalk; By-laws Nos. 21 and 14 of the Corporation of the Village of Exeter; By-laws Nos. 29 and 30 of the Corporation of the Village of Flesherton; By-laws Nos. 165 and 166 of the Corporation of the Village of Milverton; By-laws Nos. 318 and 321 of the Corporation of the Village of Shelburne; By-laws Nos. 320, 321 and 327 of the Corporation of the Village of Thamesville; By-laws Nos. 59 and 60 of the Corporation of the Village of Tavistock; By-laws Nos. 83 and 84 of the Corporation of the Village of Victoria Harbor; By-laws Nos. 25, 243 and 259 of the Corporation of the Township of Tilbury West; By-laws Nos. 657 and 658 of the Corporation of the Township of Delaware; By-laws Nos. 304 and 305 of the Corporation of the Township of Egremont; By-laws Nos. 723, 724 and 745 of the Corporation of the Township of Westminster; By-laws Nos. 596 and 597 of the Corporation of the Township of Beverly; By-law No. 592 of the Corporation of the

Township of Ancaster; By-laws Nos. 532 and 542 of the Corporation of the Township of Caradoc; By-laws Nos. 553 and 585 of the Corporation of the Township of South Dumfries; By-law No. 631 of the Corporation of the Township of Tay; By-laws Nos. 811, 849 and 851 of the Corporation of the Township of Toronto are confirmed and declared to be legal, valid and binding upon such corporations and the ratepayers thereof, respectively, and shall not be open to question upon any ground whatsoever, notwithstanding the requirements of *The Power Commission Act*, or the amendments thereto or of any other statute.

Rev. Stat.
c. 39.

14. The Municipal Corporation of the City of Niagara Falls, the Municipal Corporation of the Town of Blenheim, the Municipal Corporation of the Town of Bothwell, the Municipal Corporation of the Town of Harriston, the Municipal Corporation of the Town of Listowel, the Municipal Corporation of the Town of Palmerston, the Municipal Corporation of the Town of Petrolia, the Municipal Corporation of the Town of Ridgetown, the Municipal Corporation of the Village of Ailsa Craig, the Municipal Corporation of the Village of Dutton, the Municipal Corporation of the Village of Exeter, the Municipal Corporation of the Village of Milverton, the Municipal Corporation of the Village of Thamesville, the Municipal Corporation of the Village of Tavistock, the Municipal Corporation of the Police Village of Delaware, the Municipal Corporation of the Police Village of Lambeth, the Municipal Corporation of the Police Village of Lynden, the Municipal Corporation of the Police Village of St. George, the Municipal Corporation of the Township of Toronto are added as parties of the second part to the contract set out in Schedule "A" to *The Power Commission Act 1909*, as varied, confirmed and amended by the said Act, and as further varied, confirmed and amended by the Act passed in the tenth year of the reign of His late Majesty King Edward VII, chaptered 16, and by subsequent Acts and by this Act, and the said contract shall be binding upon the parties thereto, respectively, as to the City of Niagara Falls, from the 15th day of December, 1915; as to the Town of Blenheim, from the 15th day of June, 1915; as to the Town of Bothwell, from the 21st day of June, 1915; as to the Town of Harriston, from the 27th day of August, 1915; as to the Town of Listowel, from the 23rd day of August, 1915; as to the Town of Palmerston, from the 23rd day of August, 1915; as to the Town of Petrolia, from the 11th day of August, 1915; as to the Town of Ridgetown, from the 16th day of June, 1915; as to the Village of Ailsa Craig, from the 5th day of July, 1915; as to the Village of Dutton, from the 29th day of March, 1915; as to the Village of Exeter, from the 5th day of August, 1915; as to the Village of Milverton, from the 30th day of September, 1915; as to the Village of Thamesville, from the 15th day of June, 1915; as to the Village of Tavistock, from the 22nd day of September, 1914; as to the Police Village of Delaware, from the 1st day of April, 1915; as to the Police Village of Lambeth, from the 18th day of February, 1915; as to the Police Village of Lynden, from the 28th day of June, 1915; as to the Police Village of St. George, from the 14th day of June, 1915; as to the Township of Toronto, from the 10th day of June, 1913.

Certain corporations added as parties to contract with Commission.

Time from which contract to be binding on corporations added.

Amendment
of schedule
to contract.

15. The names of the said municipal corporations are added to Schedule "B" of the said contract, and such schedule shall be read as containing the particulars set out in Schedule "A" to this Act.

Certain
other
contracts
confirmed.

16. The contracts set out as Schedules "A," "B," "C," "D," "E," "F," "G," "H," "I," "J," "K," "L," and "M" hereto between the Hydro-Electric Power Commission of Ontario and the Corporations of the Town of Chesley, the Town of Durham, the Town of Gravenhurst, the Town of Huntsville, the Town of Markdale, the Town of Mount Forest, the Village of Chatsworth, the Village of Dundalk, the Village of Flesherton, the Village of Shelburne, the Village of Victoria Harbor, the Police Village of Holstein, and the Police Village of Williamsburg are hereby confirmed and declared to be legal, valid and binding upon the parties thereto respectively, and shall not be open to question upon any grounds whatsoever, notwithstanding the requirements of *The Power Commission Act*, or the amendments thereto or any other statute.

Rev. Stat
c. 39.

SCHEDULE "A."

Column 1	2	3	4	5	6	7
Name of Municipal Corporation.	Quantity of Power applied for in H.P.	Maximum Price of Power at Niagara Falls.	*No. of Volts.	Estimate maximum cost of power ready for distribution in Municipality.	Estimate proportionate part of costs to construct trans- mission line, transformer stations and works for nominally 30,000 H.P., with total capacity of 60,000 H.P.	Estimate proportionate part of line loss and of part cost to operate, maintain, repair, renew and insure trans- mission line, transformer stations and works for nomi- nally 30,000 H.P., with total capacity of 60,000 H.P.
				\$ c.	\$ c.	\$ c.
Niagara Falls	2,000	.....	.....	11 50	17,500 00	1,185 00
Blenheim	250	.....	.....	43 70	74,901 00	4,122 00
Bothwell	150	.....	.....	59 26	70,905 00	3,427 00
Harriston	200	.....	.....	46 62	64,706 00	3,440 00
Listowel	300	.....	.....	37 41	74,565 00	3,927 00
Palmerston	200	.....	.....	40 82	55,208 00	2,926 00
Petrolia	500	.....	.....	36 26	117,295 00	6,512 00
Ridgetown	200	.....	.....	47 17	65,016 00	3,645 00
Ailsa Craig	100	.....	.....	49 67	32,784 00	2,063 00
Dutton	50	.....	.....	43 53	15,130 00	849 00
Exeter	200	.....	.....	43 70	59,550 00	3,247 00
Milverton	200	.....	.....	35 63	46,986 00	2,446 00
Thamesville	125	.....	.....	45 40	38,779 00	3,183 10
Tavistock	100	.....	.....	49 50	35,173 00	2,010 00
Delaware	25	.....	.....	46 56	8,704 00	434 17
Lambeth	25	.....	.....	46 56	8,704 00	434 17
Lynden	120	.....	.....	33 00	21,714 00	1,621 00
St. George	100	.....	.....	38 78	24,384 00	1,456 00
Toronto Township	100	.....	.....	25 00	13,680 00	807 00

*Number required by each Corporation.

SCHEDULE "B."

This indenture made the 6th day of October, 1915,

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called the "Commission," party of the first part;

and

The Municipal Corporation of the Town of Chesley, hereinafter called the "Corporation," party of the second part.

Whereas the Corporation under the provisions of the *Power Commission Act* and amendments thereto, Revised Statutes of Ontario Chapter 39, has applied to the Commission for a supply of power, and has passed a by-law No. 612, passed the eighteenth day of October, 1915, to authorize the execution of an agreement therefor.

Now therefore this indenture witnesseth, that in consideration of the premises and of the agreement of the Corporation herein set forth, subject to the provisions of the said Act and amendments thereto, the parties hereto agree each with the other as follows:—

1. The Commission agrees:

(a) To reserve and deliver at the earliest possible date four hundred (400) h.p., or more, of electrical power to the Corporation.

(b) At the expiration of reasonable notice, in writing, which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for.

(c) To use at all times first-class, modern, standard commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) To deliver commercially continuous twenty-four (24) hour power every day in the year to the Corporation at the distribution bus bars in the Commission's sub-station within the Corporation's limits.

2. The Corporation agrees:

(a) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement so as to be able to receive power when the Commission is ready to deliver same.

(b) To pay annually in twelve (12) equal monthly instalments interest upon its proportionate part, (based on the quantity of electrical energy or power taken) of all moneys expended by the Commission on capital account for the acquiring of properties and rights, and acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations and other works necessary for the delivery of said electrical energy or power to the Corporation under the terms of this contract.

To pay an annual sum for its proportionate part of all moneys expended by the Commission on capital account for the acquiring of the said properties and rights, and the cost of the said construction, so as to form in thirty (30) years a sinking fund for the retirement of securities issued by the Province of Ontario.

Also to bear its proportionate part of the line loss, and pay its proportionate part of the cost to operate, maintain, repair, renew and insure the said generating plants, transformer stations, transmission lines, distributing stations, and other necessary works.

All payments under this clause shall be subject to adjustment under paragraph 6.

(c) The amounts payable in accordance with clause 2 (b) shall be paid in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bills remain unpaid for fifteen days, the Commission may, in addition to all other remedies, and without notice, discontinue the supply of power to the Corporation until said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisos, and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(d) To take electric power exclusively from the Commission during the continuance of this agreement.

(e) To pay for three-fourths of the power ordered from time to time by the Corporation, and held in reserve for it, as herein provided, whether it takes the same or not. When the highest average amount of power taken for any twenty (20) consecutive minutes during any month exceeds during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

If the Corporation during any month takes more than the amount of power ordered and held in reserve for it, as determined by an integrated peak, or the highest average, for a period of twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve, such increased quantity of power in accordance with the terms and conditions of this contract.

When the power factor of the highest average amount of power taken for said twenty consecutive minutes falls below 90 per cent., the Corporation shall pay for 90 per cent. of said power divided by the power factor.

(f) To use at all times first-class, modern standard commercial apparatus and plant, to be approved by the Commission, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and of the Corporation.

(g) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement, and of the said Act.

3. This agreement shall remain in force for thirty (30) years from the date of the first delivery of power under this contract.

4. The power shall be alternating, three-phase, having a periodicity of approximately 60 cycles per second, and shall be delivered as aforesaid at a voltage suitable for local distribution.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Commission, and to take records at all reasonable hours.

6. The Commission shall at least annually, adjust and apportion the amount or amounts payable by the Municipal Corporation or Corporations, for such power and such interest, sinking fund, cost of lost power, and cost of generating, operating, maintaining, repairing, renewing and insuring said works.

7. It is hereby declared that the Commission is to be a trustee of all property held by the Commission under this agreement for the Corporation and other Municipal Corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporations and other Municipal Corporations, supplied by the Commission, having regard to the amounts paid by them respectively, under the terms of this agreement, and such other considerations as may appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

8. If at any time any other Municipal Corporation, or pursuant to said Act, any railway or distributing company, or any other corporation, or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and the Corporation, in writing, of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants, as to the price to be paid for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred and paid, and to be paid by the Corporation, appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said works or any part thereof are not adequate for such supply, or if the supply of the Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of a municipal corporation taking power from the Commission at the time of such application without the written consent of such corporation.

In determining the quantity of power supplied to a municipal corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant, other than a municipal corporation, shall be computed as part of the quantity supplied to such corporation, but such corporation shall not be liable for payment for any portion of the power supplied. No power

shall be supplied by the municipal corporation to any railway or distributing company without the written consent of the Commission, but the Corporation may sell power to any person or manufacturing companies within the limits of the Corporation, but such power shall not be sold for less than cost. neither shall there be any discrimination as regards price and quantity.

9. If differences arise between corporations to which the Commission is supplying power, the Commission may, upon application, fix a time and place and hear all representations that may be made by the parties, and the Commission shall, in a summary manner, when possible, adjust such differences, and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a commissioner appointed under the *Act respecting Enquiries concerning Public Matters*.

10. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof, the Commission and the Corporation have, respectively, affixed their corporate seals and the hands of their proper officers.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

A. BECK, *Chairman*.

W. W. POPE, *Secretary*.

MUNICIPAL CORPORATION OF THE TOWN OF CHESLEY.

C. J. HALLIDAY, *Mayor*.

H. S. SANDERSON, *Clerk*.

SCHEDULE "C."

This indenture made in duplicate the day of
in the year of our Lord,

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called
the "Commission," party of the first part;

and

The Municipal Corporation of the Town of Durham hereinafter called
the "Corporation," party of the second part.

Whereas, pursuant to an Act to provide for the transmission of electrical power to municipalities known as the *Power Commission Act* and amendments thereto, the Corporation applied to the Commission for supply of power, and the Commission furnished the Corporation with estimates of the total cost of such power, ready for distribution within the limits of the

Corporation (and the electors of the Corporation assented to the by-laws authorizing the Corporation to enter into a contract with the Commission for such power).

1. Now therefore this indenture witnesseth that in consideration of the premises and of the agreement of the Corporation herein set forth, subject to the provisions of the said Act and amendments thereto, the Commission agrees with the Corporation.

(a) To reserve and deliver at the earliest possible date 100 h.p. or more of electrical power to the Corporation.

(b) At the expiration of reasonable notice in writing which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for.

(c) To use at all times first-class, modern, standard, commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) To deliver commercially continuously 24-hour power every day in the year to the Corporation at the distribution bus bars in the Commission's substation within the Corporation's limits.

2. In consideration of the premises and of the agreements herein set forth, the Corporation agrees with the Commission.

(a) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement so as to be able to receive power when the Commission is ready to deliver same.

(b) To pay annually, interest at rate payable by the Commission upon the Corporation's proportionate part (based on the quantity of electrical energy or power taken) of all moneys expended by the Commission on capital account for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations, and other works necessary for the delivery of said electrical energy or power to the Corporation under the terms of this contract.

Also to pay an annual sinking fund instalment of such amount as to form at the end of 30 years, with accrued interest, a sinking fund sufficient to repay the Corporation's proportionate part, based as aforesaid, of all moneys advanced by the Province of Ontario, for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations and other work necessary for the delivery of said electrical energy or power, delivered to the Corporation under the terms of this contract. Also to pay the Corporation's proportionate part, based as aforesaid, of the cost of lost power and of the cost of operating, maintaining, repairing, renewing and insuring said generating plants, transformer stations, transmission lines, distributing stations and other necessary work. Subject to adjustment under Clause 6 of this agreement.

(c) The amounts payable under this contract shall be paid in twelve monthly payments, in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bill remains unpaid for fifteen days, the Commission may, in addition to all other remedies and without notice, discontinue the supply of power to the Corporation until said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisos and conditions herein contained. All payments in arrears shall bear interest at the legal rate;

(d) To take electric power exclusively from the Commission during the continuance of this agreement.

(e) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement, and of the said Act.

(f) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for it as herein provided whether it takes the same or not. When the highest average amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

(g) If the Corporation during any month takes more than the amount of power ordered and held in reserve for it, as determined by an integrated peak, or the highest average, for a period of twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve, such increased quantity of power in accordance with the terms and conditions of this contract.

(h) When the power factor of the highest average amount of power taken for said twenty consecutive minutes falls below 90 per cent. the Corporation shall pay for 90 per cent. of said power divided by the power factor.

(i) To use at all times first-class, modern, standard commercial apparatus and plant, to be approved by the Commission.

(j) To exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and of the Corporation.

3. This agreement shall remain in force for thirty years from date of the first delivery of power under this contract.

4. The power shall be alternating, three phase, having a periodicity of approximately 60 cycles per second and shall be delivered as aforesaid at a voltage suitable for local distribution.

(a) That the meters with their series and potential transformers shall be connected at the point of delivery.

(b) The maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the substation in the limits of the Corporation shall constitute the supply of all power involved herein and the fulfilment of all operating obligations hereunder, and when voltage and frequency are so maintained, the amount of power, its fluctuations, load factor, power factor, distribution as to phases and all other electric characteristics and qualities, are under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Corporation and take records at all reasonable hours.

6. The Commission shall at least annually adjust and apportion the amount or amounts payable by the Municipal Corporation or Corporations for such power and such interest, sinking fund, cost of lost power and cost of generating, operating, maintaining, repairing, renewing and insuring said works.

If at any time any other Municipal Corporation, or pursuant to said Act, any railway or distributing company, or any other Corporations or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and the involved Corporation or Corporations in writing, of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants as to the price to be paid, for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid and to be paid by the Corporation, appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said works or any part thereof are not adequate for such supply, or if the supply of the Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of a Municipal Corporation taking power from the Commission at the time of such application without the written consent of such Corporation.

In determining the quantity of power supplied to a Municipal Corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant, other than a Municipal Corporation shall be computed as part of the quantity supplied to such Corporation, but such Corporation shall not be liable for payment for any portion of the power so supplied. No power shall be supplied by the Municipal Corporation to any railway or distributing company without the written consent of the Commission. Power shall not be sold for less than the cost and there shall be no discrimination as regards price and quantity.

7. It is hereby declared that the Commission is to be a trustee of all property held by the Commission under this agreement for the Corporation or Corporations supplied by the Commission but the Commission shall be entitled to a lien upon said property for all moneys expended by the Com-

mission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporation and any other (if any) supplied by the Commission, having regard to the amounts paid by them respectively under the terms of this agreement, and such other consideration as may appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

8. If differences arise between Corporations to which the Commission is supplying power, the Commission may upon application fix a time and place and hear all representations that may be made by the parties and the Commission, shall, in a summary manner, when possible, adjust such differences and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a Commissioner appointed under the *Act respecting Enquiries concerning Public Matters*.

9. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the Commission and the Corporation have respectively affixed their corporate seals and the hands of their proper officers.

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

A. BECK, *Chairman*.

W. W. POPE, *Secretary*.

(Seal.)

MUNICIPAL CORPORATION OF THE TOWN OF DURHAM.

A. S. HUNTER, *Mayor*.

WM. B. VOLLET, *Clerk*.

(Seal.)

SCHEDULE "D."

This indenture made in duplicate the Twenty-fifth day of October, in the year of our Lord, One Thousand Nine Hundred and Fifteen.

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called "The Commission," party of the first part;

and

The Municipal Corporation of the Town of Gravenhurst, hereinafter called "The Corporation," party of the second part.

Whereas pursuant to an Act to provide for the transmission of electric power to municipalities, known as *The Power Commission Act*, and amendments thereto, the Corporation applied to the Commission for a supply of power, and the Commission furnished the Corporation with estimates of the total cost of such power, ready for distribution within the limits of the

Corporation (and the electors of the Corporation assented to the by-laws authorizing the Corporation to enter into a contract with the Commission for such power).

1. Now therefore this indenture witnesseth that in consideration of the premises and of the agreements of the Corporation herein set forth, subject to the provisions of the said Act and amendments hereto, the Commission agrees with the Corporation:

(a) To reserve and deliver at the earliest possible date 300 h.p., or more, of electrical power to the Corporation.

(b) At the expiration of reasonable notice in writing, which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation when called for any additional electrical power then available.

(c) To use at all times first-class, modern, standard, commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) To deliver commercially continuous 24-hour power every day in the year to the Corporation at the outgoing line bracket on the Commission's generating station at South Falls on the south branch of the Muskoka River.

2. In consideration of the premises and of the agreements herein set forth, the Corporation agrees with the Commission:

(a) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement so as to be able to receive power when the Commission is ready to deliver same.

(b) To pay annually to the Commission the Corporation's proportionate part of interest and sinking fund (based on the quantity of electrical energy or power taken) on all moneys expended by the Commission on capital account for the acquiring of properties and rights and acquiring and construction of generating plant and other works necessary for the delivery of said electrical power or energy to the Corporation under the terms of this agreement.

Also to pay annually to the Commission the Corporation's proportionate part (based as above) of the cost of lost power and operating, maintaining, repairing, renewing and insuring the generating plant and other necessary works.

(c) The amounts payable under this contract shall be paid in twelve monthly payments, in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bill remains unpaid for fifteen days, the Commission may, in addition to all other remedies and without notice discontinue the supply of power to the Corporation until the said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisoes and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(d) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement and of the said Acts.

(e) To take electric power exclusively from the Commission during the continuance of this agreement.

(f) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for it as herein provided whether it takes the same or not. When the greatest average amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

(g) If the Corporation during any month takes more than the amount of power ordered and held in reserve for it, for twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve such increased quantity of power in accordance with the terms and conditions of this contract.

(h) When the power factor of the greatest amount of power taken for said twenty consecutive minutes falls below 90%, the Corporation shall pay for 90% of said power divided by the power factor.

(i) To use at all times first-class, modern, standard, commercial apparatus and plant approved by the Commission.

(j) To exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and the Corporation.

3. This agreement shall remain in force for 16 years from the date of the first delivery of power under this contract.

4. The power shall be alternating, three-phase, having a periodicity of approximately 60 cycles per second, and shall be delivered as aforesaid at approximately 6,600 volts.

(a) The metres, with their series and potential transformers, shall be connected at the point of delivery as near as practicable.

(b) The maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the generating station at South Falls on the Muskoka River shall constitute the supply of all power involved herein, and the fulfilment of all operating obligations hereunder, and when the voltage and frequency are so maintained, the amount of the power, its fluctuations, load factor, power factor, distribution as to phases, and all other electrical characteristics and qualities are under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

5. The engineers of the Commission, or one or more of them, or any person or persons appointed for this purpose by the Commission, shall have

the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Corporation and take records at all reasonable hours.

6. The Commission shall at least annually adjust and apportion the amount or amounts payable by the Municipal Corporation or Corporations for such power and such interest, sinking fund, cost of lost power, and cost of generating, operating, maintaining, repairing, renewing and insuring said works.

If at any time any other municipal corporation, or, pursuant to said Act, any railway or distributing company, or any other corporation or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and involved corporation or corporations in writing of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants as to the price to be paid for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid, and to be paid by the Corporation, appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said works or any part thereof are not adequate for such supply, or if the supply of said Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of said Municipal Corporation taking power from the Commission at the time of such application without the written consent of such Corporation.

In determining the quantity of power supplied to a Municipal Corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant other than a Municipal Corporation shall be computed as a part of the quantity supplied to such Corporation, but such Corporation shall not be liable for payment for any portion of the power so supplied. No power shall be supplied by the Municipal Corporation to any railway or distributing company without the written consent of the Commission. Power shall not be sold for less than the cost, and there shall be no discrimination as regards price and quantity.

7. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporation and any other (if any) supplied by the Commission.

8. If differences arise between Corporations to which the Commission is supplying power, the Commission may, upon application, fix a time and place and hear all representations that may be made by the parties, and the Commission shall in a summary manner, when possible, adjust such differences, and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a Commissioner appointed under *The Act Respecting Inquiries Concerning Public Matters*.

9. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the "Commission" and the "Corporation" have respectively affixed their corporate seals and the hand of their proper officers.

Signed, sealed and delivered this twenty-fifth day of October, 1915, A.D.,
in the presence of

HYDRO-ELECTRIC POWER COMMISSION.

A. BECK, *Chairman.*

W. W. POPE, *Secretary.*

(Seal)

MUNICIPAL CORPORATION OF THE TOWN OF GRAVENHURST.

ARCHY. SLOAN, *Mayor.*

W. H. BUTTERWORTH, *Town Clerk.*

(Seal)

SCHEDULE "E."

This Indenture, made in Duplicate the 10th day of March, in the year of
our Lord one thousand nine hundred and fifteen (1915).

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called
"The Commission," party of the first part;

and

The Municipal Corporation of the Town of Huntsville, hereinafter
called "The Corporation," party of the second part.

Whereas pursuant to an Act to provide for the transmission of electric power to municipalities known as *The Power Commission Act* and amendments thereto, the Corporation applied to the Commission for a supply of power, and the Commission furnished the Corporation with estimates of the total cost of such power, ready for distribution within the limits of the Corporation (and the electors of the Corporation assented to the By-laws, authorizing the Corporation to enter into a contract with the Commission for such power).

1. Now therefore this indenture witnesseth that in consideration of the premises and of the agreement of the Corporation herein set forth, subject to the provisions of the said Act and amendments thereto, the Commission agrees with the Corporation:

(a) To reserve and deliver at the earliest possible date 800 h.p. or more of electrical power to the Corporation.

(b) At the expiration of reasonable notice in writing, which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electrical power when called for.

(c) To use at all times first-class, modern, standard commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) To deliver commercially continuous twenty-four-hour power every day in the year to the Corporation at the distribution bus bars in the Commission's substation within the Corporation's limits.

2. In consideration of the premises and of the agreements herein set forth, the Corporation agrees with the Commission:

(a) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement so as to be able to receive power when the Commission is ready to deliver the same.

(b) To pay annually interest at 4% to 4½% per annum upon the Corporation's proportionate part (based on the quantity of electrical energy or power taken) of all moneys expended by the Commission on capital account for the acquiring of properties and rights, and acquiring the construction of generating plants, transformer stations, transmission lines, distributing stations, and other works necessary for the delivery of the said electrical power or energy to the Corporation under the terms of this contract.

Also to pay an annual sinking fund instalment of such amount as to form at the end of sixteen years, with accrued interest, a sinking fund sufficient to repay the Corporation's proportionate part, based as aforesaid, of all moneys advanced by the Province of Ontario for the acquiring of the properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations, and other work necessary for the delivery of electrical energy or power, delivered to the Corporation under the terms of this contract. Also to pay the Corporation's proportionate part, based as aforesaid, on the cost of lost power, and the cost of operating, maintaining, repairing, renewing and insuring said generating plants, transformer stations, transmission lines, distributing stations, and other necessary works.

(c) The amounts payable under this contract shall be paid in twelve monthly payments, in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bill remains unpaid for fifteen days, the Commission may, in addition to all other remedies and without notice, discontinue the supply of power to the Corporation until the said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisoes and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(d) To take electric power exclusively from the Commission during the continuance of this agreement.

(e) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement, and of the said Act.

(f) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for it as herein provided, whether it takes the same or not. When the highest amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

(g) If the Corporation during any month takes more than the amount of power ordered and held in reserve for it for twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve such increased quantity of power in accordance with the terms and conditions of this contract.

(h) When the power factor of the highest amount of power taken for said twenty consecutive minutes falls below 90% the Corporation shall pay for 90% of said power divided by the power factor.

(i) To use at all times first-class modern, standard, commercial apparatus and plant approved by the Commission.

(j) To exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and the Corporation.

3. This agreement shall remain in force sixteen years from the date of the first delivery of power under this contract.

4. The power shall be alternating, three phase, having a periodicity of approximately sixty cycles per second, and shall be delivered as aforesaid at a voltage suitable for local distribution.

(a) That the meters with their series and potential transformers shall be connected at the point of delivery.

(b) That the maintenance by the Commission of approximately the agreed voltage, at approximately the agreed frequency at the substation in the limits of the Corporation shall constitute the supply of all power involved herein, and the fulfilment of all operating obligations hereunder, and when the voltage and frequency are so maintained, the amount of the power, its fluctuations, load factor, power factor, distribution as to phases, and all other electrical characteristics and qualities are under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

5. The engineers of the Commission, or one or more of them, or any person or persons appointed for this purpose by the Commission shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant, property of the Corporation and take records at all reasonable hours.

6. The Commission shall at least annually adjust and apportion the amount or amounts payable by the municipal corporation or corporations for such power and such interest, sinking fund, cost of lost power, and cost of generating, operating, maintaining, repairing, renewing, and insuring said works.

If at any time any other municipal corporation, or pursuant to said Act, any railway or distributing company, or any other corporation or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and involved corporation or corporations in writing of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants as to the price to be paid, for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid, and to be paid by the Corporation, appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said works or any part thereof are not adequate for such supply, or if the supply of said Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of said municipal corporation taking power from the Commission at the time of such application without the written consent of such corporation.

In determining the quantity of power supplied to a municipal corporation the quantity supplied by the Commission within the limits of the corporation to any applicant other than a municipal corporation shall be computed as a part of the quantity supplied to such corporation, but such corporation shall not be liable for payment for any portion of the power so supplied. No power shall be supplied by the municipal corporation to any railway or distributing company without the written consent of the Commission. Power shall not be sold for less than the cost, and there shall be no discrimination as regards price and quantity.

7. It is hereby declared the Commission is to be a trustee of all property held by the Commission under this agreement for the corporation or corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporation and any other (if any) supplied by the Commission, taking regard to the amounts paid by them respectively under the terms of this agreement, and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

8. If differences arise between corporations to which the Commission is supplying power, the Commission may, upon application, fix a time and place, and hear all representations that may be made by the parties, and the Commission shall in a summary manner, when possible, adjust such differences, and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a Commissioner appointed under *The Act respecting Enquiries Concerning Public Matters*.

9. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the "Commission" and the "Corporation" have respectively affixed their corporate seals and the hand of their proper officers.

HYDRO-ELECTRIC POWER COMMISSION.

A. BECK, *Chairman*.

W. W. POPE, *Secretary*.

(Seal)

MUNICIPALITY OF THE TOWN OF HUNTSVILLE.

H. E. RISE, *Mayor*.

J. M. CULLON, *Clerk*.

(Seal.)

SCHEDULE "F."

This Indenture, made the 11th day of September, 1915.

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called the "Commission," party of the first part;

and

The Municipal Corporation of the Town of Markdale, hereinafter called the "Corporation," party of the second part.

Whereas the Corporation, under the provisions of *The Power Commission Act* and amendments thereto, Revised Statutes of Ontario, Chapter 39, has applied to the Commission for a supply of power and has passed a By-law No. 265, passed the 30th day of July, 1915, to authorize the execution of an agreement therefor.

Now therefore this indenture witnesseth that in consideration of the premises and of the agreement of the Corporation herein set forth, subject to the provisions of the said Act and amendments thereto, the parties hereto agree each with the other as follows:

1. The Commission agrees:

(a) To reserve and deliver at the earliest possible date one hundred and fifty (150) horse power, or more, of electrical power to the Corporation.

(b) At the expiration of reasonable notice, in writing, which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for.

(c) To use at all times first-class, modern, standard commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) To deliver commercially continuous twenty-four (24) hour power every day in the year to the Corporation at the distribution bus bars in the Commission's substation within the Corporation's limits.

2. The Corporation agrees:

(a) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement so as to be able to receive power when the Commission is ready to deliver same.

(b) To pay annually in twelve (12) equal monthly instalments, interest upon its proportionate part (based on the quantity of electrical energy or power taken) of all moneys expended by the Commission on capital account for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations, and other works necessary for the delivery of said electrical energy or power to the Corporation under the terms of this contract.

To pay an annual sum for its proportionate part of all moneys expended by the Commission on capital account for the acquiring of the said properties and rights, and the cost of the said construction, so as to form in thirty (30) years a sinking fund for the retirement of securities issued by the Province of Ontario.

Also to bear its proportionate part of the line loss and pay its proportionate part of the cost to operate, maintain, repair, renew, and insure the said generating plants, transformer stations, transmission lines, distributing stations, and other necessary works.

All payments under this clause shall be subject to adjustment under paragraph 6.

(c) The amounts payable in accordance with clause 2 (b) shall be paid in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bills remain unpaid for fifteen days the Commission may, in addition to all other remedies and without notice, discontinue the supply of power to the Corporation until said bill is paid. No such discontinuance shall relieve the corporation from the performance of the covenants, provisoes and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(d) To take electric power exclusively from the Commission during the continuance of this agreement.

(e) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for it as herein provided, whether it takes the same or not. When the highest average amount of power taken for any twenty consecutive minutes during any month exceeds during the twenty consecutive minutes three-fourths of the amount ordered by the

Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

If the Corporation during any month takes more than the amount of power ordered and held in reserve for it, as determined by an integrated peak, or the highest average, for a period of twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve, such increased quantity of power in accordance with the terms and conditions of this contract.

When the power factor of the highest average amount of power taken for said twenty consecutive minutes falls below 90 per cent., the Corporation shall pay for 90 per cent. of said power divided by the power factor.

(f) To use at all times first-class, modern, standard commercial apparatus and plant, to be approved by the Commission, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and of the Corporation.

(g) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement, and of the said Act.

3. This agreement shall remain in force for thirty (30) years from the date of the first delivery of power under this contract.

4. The power shall be alternating, three-phase, having a periodicity of approximately 60 cycles per second, and shall be delivered as aforesaid at a voltage suitable for local distribution.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time, during the continuance of this agreement, to inspect the apparatus, plant, and property of the Corporation, and take records at all reasonable hours.

6. The Commission shall at least annually adjust and apportion the amount or amounts payable by the Municipal Corporation or Corporations for such power and such interest, sinking fund, cost of lost power and cost of generating, operating, maintaining, repairing, renewing and insuring said works.

7. It is hereby declared that the Commission is to be a trustee of all property held by the Commission under this agreement for the Corporations and other municipal corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporations and other municipal corporations, supplied by the Commission, having regard to the amounts paid by them, respectively, under the terms of this agreement, and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

8. If at any time any other municipal corporation, or pursuant to said Act, any railway or distributing company, or any other corporation or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and the Corporation, in writing, of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants as to the price to be paid, for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid, and to be paid by the Corporation, appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said works, or any part thereof, are not adequate for such supply, or if the supply of the Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of a municipal corporation taking power from the Commission at the time of such application, without the written consent of such Corporation.

In determining the quantity of power supplied to a municipal corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant, other than a municipal corporation, shall be computed as part of the quantity supplied to such Corporation, but such Corporation shall not be liable for payment for any portion of the power so supplied. No power shall be supplied by the municipal corporation to any railway or distributing company, without the written consent of the Commission, but the Corporation may sell power to any person or persons, or manufacturing companies within the limits of the Corporation, but such power shall not be sold for less than cost; neither shall there be any discrimination as regards price and quantity.

9. If differences arise between corporations to which the Commission is supplying power, the Commission may, upon application, fix a time and place and hear all representations that may be made by the parties, and the Commission shall, in a summary manner, when possible, adjust such differences, and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a commissioner appointed under the *Act respecting Enquiries concerning Public Matters*.

10. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof, the Commission and the Corporation have respectively affixed their Corporate Seals and the hands of their proper officers.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

A. BECK, *Chairman*,
W. W. POPE, *Secretary*.

(SEAL.)

MUNICIPAL CORPORATION OF THE TOWN OF MARKDALE.

R. W. EMIER, *Reeve*.
R. GILFILLAN, *Clerk*.

(SEAL.)

SCHEDULE "G."

This Indenture made in duplicate the 15th day of March, in the year of our Lord, 1915.

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called the "Commission," party of the first part;

and

The Municipal Corporation of the Town of Mount Forest, hereinafter called the "Corporation," party of the second part.

Whereas, pursuant to an Act to provide for the transmission of electrical power to municipalities known as the *Power Commission Act* and amendments thereto, the Corporation applied to the Commission for a supply of power, and the Commission furnished the Corporation with estimates of the total cost of such power, ready for distribution within the limits of the Corporation (and the electors of the Corporation assented to the by-laws authorizing the Corporation to enter into a contract with the Commission for such power).

1. Now therefore this indenture witnesseth that in consideration of the premises and of the agreement of the Corporation herein set forth, subject to the provisions of the said Act and amendments thereto, the Commission agrees with the Corporation:

(a) To reserve and deliver at the earliest possible date 400 h.p. or more of electrical power to the Corporation.

(b) At the expiration of reasonable notice in writing which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for.

(c) To use at all times first-class, modern, standard commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) To deliver commercially continuous 24-hour power every day of the year to the Corporation at the distribution bus bars in the Commission's sub-station within the Corporation's limits.

2. In consideration of the premises and of the agreement herein set forth, the Corporation agrees with the Commission:

(a) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement, so as to be able to receive power when the Commission is ready to deliver same.

(b) To pay annually, interest at rate payable by the Commission upon the Corporation's proportionate part (based on the quantity of electrical energy or power taken) of all moneys expended by the Commission on

capital account for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations, and other works necessary for the delivery of said electrical energy or power to the Corporation under the terms of this contract.

Also to pay an annual sinking fund instalment of such amount as to form at the end of 30 years, with accrued interest, a sinking fund sufficient to repay the Corporation's proportionate part, based as aforesaid, of all moneys advanced by the Province of Ontario for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations and other work necessary for the delivery of said electrical energy or power, delivered to the Corporation under the terms of this contract. Also to pay the Corporation's proportionate part, based as aforesaid, of the cost of lost power and of the cost of operating, maintaining, repairing, renewing and insuring said generating plants, transformer stations, transmission lines, distributing stations and other necessary works. Subject to adjustment under Clause 6 of this agreement.

(c) The amount payable under this contract shall be paid in twelve monthly payments, in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bill remains unpaid for fifteen days, the Commission may, in addition to all other remedies and without notice, discontinue the supply of power to the Corporation until said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisoes and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(d) To take electric power exclusively from the Commission during the continuance of this agreement.

(e) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement, and of the said Act.

(f) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for its as herein provided, whether it takes the same or not. When the highest average amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

(g) If the Corporation during any month takes more than the amount of power ordered and held in reserve for it, as determined by an integrated peak, or the highest average, for a period of twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve, such increased quantity of power in accordance with the terms and conditions of this contract.

(h) When the power factor of the highest average amount of power taken for said twenty consecutive minutes falls below 90 per cent., the Corporation shall pay for 90 per cent. of said power divided by the power factor.

(i) To use at all times first-class, modern, standard commercial apparatus and plant, to be approved by the Commission.

(j) To exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and of the Corporation.

3. This agreement shall remain in force for thirty years from date of the first delivery of power under this contract.

4. The power shall be alternating, three-phase, having a periodicity of approximately 60 cycles per second and shall be delivered as aforesaid at a voltage suitable for local distribution.

(a) That the meters, with their series and potential transformers, shall be connected at the point of delivery.

(b) The maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the sub-station in the limits of the Corporation shall constitute the supply of all power involved herein and the fulfilment of all operating obligations hereunder, and when voltage and frequency are so maintained, the amount of power, its fluctuations, load factor, power factor, distribution as to phases and all other electric characteristics and qualities, are under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time during the continuance of this agreement, to inspect the apparatus, plant and property of the Corporation, and take records at all reasonable hours.

6. The Commission shall at least annually adjust and apportion the amount or amounts payable by the Municipal Corporation or Corporations for such power and such interest, sinking fund, cost of lost power and cost of generating, operating, maintaining, repairing, renewing and insuring said works.

If at any time any other Municipal Corporation, or pursuant to said Act, any railway or distributing company, or any other Corporations or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and the involved Corporation or Corporations, in writing, of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants as to the price to be paid, for equal quantities of power, the Commission may supply power upon such terms and conditions, as may, having regard to the risk and expense incurred, and paid, and to be paid by the Corporation, appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said works or any part thereof are not adequate for such supply, or if the supply of the Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of a Municipal Corporation taking power from the Commission at the time of such application, without the written consent of such corporation.

In determining the quantity of power supplied to a Municipal Corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant, other than a Municipal Corporation, shall be computed as part of the quantity supplied to such Corporation, but such Corporation shall not be liable for payment for any portion of the power so supplied. No power shall be supplied by the Municipal Corporation to any railway or distributing company, without the written consent of the Commission. Power shall not be sold for less than the cost, and there shall be no discrimination as regards price and quantity.

7. It is hereby declared that the Commission is to be a trustee of all property held by the Commission under this agreement for the Corporation or Corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporation and any other (if any), supplied by the Commission, having regard to the amounts paid by them respectively under the terms of this agreement, and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

8. If differences arise between Corporations to which the Commission is supplying power, the Commission may upon application fix a time and place, and hear all representations that may be made by the parties, and the Commission shall, in a summary manner, when possible, adjust such differences and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a Commissioner appointed under the *Act respecting Enquiries Concerning Public Matters*.

9. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the Commission and the Corporation have respectively affixed their corporate seals and the hands of their proper officers.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

A. BECK, *Chairman*,
W. W. POPE, *Secretary*.
(SEAL.)

MUNICIPAL CORPORATION OF THE TOWN OF MARKDALE.

T. CLARK, *Mayor*.
W. C. PERRY, *Clerk*.
(SEAL.)

SCHEDULE "H."

This Indenture made in duplicate the day of
in the year of our Lord,

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called
the "Commission," party of the first part;

and

The Municipal Corporation of the Village of Chatsworth, hereinafter
called the "Corporation," party of the second part.

Whereas, pursuant to an Act to provide for the transmission of electrical power to municipalities known as *The Power Commission Act* and amendments thereto, the Corporation applied to the Commission for a supply of power, and the Commission furnished the Corporation with estimates of the total cost of such power, ready for distribution within the limits of the Corporation (and the electors of the Corporation assented to the by-laws authorizing the Corporation to enter into a contract with the Commission for such power).

1. Now therefore this indenture witnesseth that in consideration of the premises and of the agreement of the Corporation herein set forth, subject to the provisions of the said Act and amendments thereto, the Commission agrees with the Corporation:

(a) To reserve and deliver at the earliest possible date 75 h.p. or more of electrical power to the Corporation.

(b) At the expiration of reasonable notice in writing which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for.

(c) To use at all times first-class, modern, standard commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) To deliver commercially continuous 24-hour power every day in the year to the Corporation at the distribution bus bars in the Commission's sub-station within the Corporation's limits.

2. In consideration of the premises and of the agreements herein set forth, the Corporation agrees with the Commission:

(a) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement, so as to be able to receive power when the Commission is ready to deliver same.

(b) To pay annually interest at rate payable by the Commission upon the Corporation's proportionate part (based on the quantity of electrical energy or power taken) of all moneys expended by the Commission on

capital account for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations and other works necessary for the delivery of said electrical energy or power to the Corporation under the terms of this contract.

Also to pay an annual sinking fund instalment of such amount as to form at the end of 30 years, with accrued interest, a sinking fund sufficient to repay the Corporation's proportionate part, based as aforesaid, of all moneys advanced by the Province of Ontario for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations, and other work necessary for the delivery of said electrical energy or power delivered to the Corporation under the terms of this contract. Also to pay the Corporation's proportionate part, based as aforesaid, of the cost of lost power and of the cost of operating, maintaining, repairing, renewing and insuring said generating plants, transformer stations, transmission lines, distributing stations and other necessary works. Subject to adjustment under clause 6 of this agreement.

(c) The amounts payable under this contract shall be paid in twelve monthly payments, in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bill remains unpaid for fifteen days, the Commission may, in addition to all other remedies, and without notice, discontinue the supply of power to the Corporation until said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisoes and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(d) To take electric power exclusively from the Commission during the continuance of this agreement.

(e) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement and of the said Act.

(f) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for it as herein provided, whether it takes the same or not. When the highest average amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

(g) If the Corporation during any month takes more than the amount of power ordered and held in reserve for it, as determined by an integrated peak, or highest average, for a period of twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve, such increased quantity of power, in accordance with the terms and conditions of this contract.

(h) When the power factor of the highest average amount of power taken for said twenty consecutive minutes falls below 90 per cent., the Corporation shall pay for 90 per cent. of said power divided by the power factor.

(i) To use at all times first-class, modern, standard commercial apparatus and plant, to be approved by the Commission.

(j) To exercise all due skill and diligence, so as to secure satisfactory operation of the plant and apparatus of the Commission and of the Corporation.

3. This agreement shall remain in force for thirty years from date of the first delivery of power under this contract.

4. The power shall be alternating, three-phase, having a periodicity of approximately 60 cycles per second, and shall be delivered as aforesaid at a voltage suitable for local distribution.

(a) That the meters, with their series and potential transformers, shall be connected at the point of delivery.

(b) The maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the sub-station in the limits of the Corporation shall constitute the supply of all power involved herein and the fulfilment of all operating obligations hereunder, and when voltage and frequency are so maintained, the amount of power, its fluctuations, load factor, power factor, distribution as to phases and all other electric characteristics and qualities, are under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Corporation and take records at all reasonable hours.

6. The Commission shall at least annually adjust and apportion the amount or amounts payable by the Municipal Corporation or Corporations for such power, and such interest, sinking fund, cost of lost power and cost of generating, operating, maintaining, repairing, renewing and insuring said works.

If at any time any other Municipal Corporation, or, pursuant to said Act, any railway or distributing company, or any other Corporations or person applies to the Commission for a supply of power, the Commission shall notify the applicant and the involved Corporation or Corporations in writing of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants as to the price to be paid for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred and paid and to be paid by the Corporation, appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said works, or any part thereof, are not adequate for such supply, or if the supply of the Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of a Municipal Corporation taking power from the Commission at the time of such application, without the written consent of such Corporation.

In determining the quantity of power supplied to a Municipal Corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant, other than a Municipal Corporation, shall be computed as part of the quantity supplied to such Corporation, but such Corporation shall not be liable for payment for any portion of the power so supplied. No power shall be supplied by the Municipal Corporation to any railway or distributing company without the written consent of the Commission. Power shall not be sold for less than the cost, and there shall be no discrimination as regards price and quantity.

7. It is hereby declared that the Commission is to be a trustee of all property held by the Commission under this agreement for the Corporation or Corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporation and any other (if any) supplied by the Commission, having regard to the amounts paid by them respectively under the terms of this agreement, and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

8. If differences arise between Corporations to which the Commission is supplying power, the Commission may, upon application, fix a time and place and hear all representations that may be made by the parties, and the Commission shall, in a summary manner, when possible, adjust such differences, and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a Commissioner appointed under *The Act Respecting Enquiries Concerning Public Matters*.

9. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the Commission and the Corporation have respectively affixed their corporate seals and the hands of their proper officers.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

J. B. LUCAS, *Vice-Chairman*.

W. W. POPE, *Secretary*.

(Seal)

THE CORPORATION OF THE VILLAGE OF CHATSWORTH.

WM. BREESE, *Reeve*.

W. G. REILLY, *Clerk*.

(Seal)

SCHEDULE "I."

This Indenture made in duplicate the 1st day of March in the year of our Lord, 1915,

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called the "Commission," party of the first part;

and

The Municipal Corporation of the Village of Dundalk, hereinafter called the "Corporation," party of the second part.

Whereas, pursuant to an Act to provide for the transmission of electrical power to municipalities, known as the *Power Commission Act* and amendments thereto, the Corporation applied to the Commission for a supply of power, and the Commission furnished the Corporation with estimates of the total cost of such power, ready for distribution within the limits of the Corporation (and the electors of the Corporation assented to the by-laws authorizing the Corporation to enter into a contract with the Commission for such power).

1. Now therefore this indenture witnesseth that in consideration of the premises and of the agreement of the Corporation herein set forth, subject to the provisions of the said Act and Amendments thereto, the Commission agrees with the Corporation:

(a) To reserve and deliver at the earliest possible date 200 h.p. or more of electrical power to the Corporation.

(b) At the expiration of reasonable notice in writing, which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for.

(c) To use at all times first-class, modern, standard, commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) To deliver commercially continuous 24-hour power every day in the year to the Corporation at the distribution bus bars in the Commission's sub-station within the Corporation's limits.

2. In consideration of the premises and of the agreements herein set forth the Corporation agrees with the Commission:

(a) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement so as to be able to receive power when the Commission is ready to deliver same.

(b) To pay annually, interest at rate payable by the Commission upon the Corporation's proportionate part (based on the quantity of electrical energy or power taken) of all moneys expended by the Commission on capital account for the acquiring of properties and rights, the acquiring and

construction of generating plants, transformer stations, transmission lines, distributing stations, and other works necessary for the delivery of said electrical energy or power to the Corporation under the terms of this contract;

Also to pay an annual sinking fund instalment of such amount as to form at the end of 30 years, with accrued interest, a sinking fund sufficient to repay the Corporation's proportionate part, based as aforesaid, of all moneys advanced by the Province of Ontario for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations and other work necessary for the delivery of said electrical energy or power, delivered to the Corporation under the terms of this contract. Also to pay the Corporation's proportionate part, based as aforesaid, of the cost of lost power and of the cost of operating, maintaining, repairing, renewing and insuring said generating plants, transformer stations, transmission lines, distributing stations and other necessary works. Subject to adjustment under clause 6 of this agreement.

(c) The amounts payable under this contract shall be paid in twelve monthly payments, in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bill remains unpaid for fifteen days, the Commission may, in addition to all other remedies and without notice, discontinue the supply of power to the Corporation until said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisoes and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(d) To take electric power exclusively from the Commission during the continuance of this agreement.

(e) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement and of the said Act.

(f) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for it as herein provided whether it takes the same or not. When the highest average amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month;

(g) If the Corporation during any month takes more than the amount of power ordered and held in reserve for it, as determined by an integrated peak, or the highest average, for a period of twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve, such increased quantity of power in accordance with the terms and conditions of this contract.

(h) When the power factor of the highest average amount of power taken for said twenty consecutive minutes falls below 90 per cent., the Corporation shall pay for 90 per cent. of said power divided by the power factor.

(i) To use at all times first-class, modern, standard commercial apparatus and plant, to be approved by the Commission.

(j) To exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and of the Corporation.

3. This agreement shall remain in force for thirty years from date of the first delivery of power under this contract.

4. The power shall be alternating, three-phase, having a periodicity of approximately 60 cycles per second and shall be delivered as aforesaid at a voltage suitable for local distribution.

(a) That the meters with their series and potential transformers shall be connected at the point of delivery.

(b) The maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the sub-station in the limits of the Corporation shall constitute the supply of all power involved herein and the fulfilment of all operating obligations hereunder, and when voltage and frequency are so maintained, the amount of power, its fluctuations, load factor, power factor, distribution as to phases and all other electric characteristics and qualities, are under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant, and property of the Corporation and take records at all reasonable hours.

6. The Commission shall at least annually adjust and apportion the amount or amounts payable by the Municipal Corporation or corporations for such power and such interest, sinking fund, cost of lost power and cost of generating, operating, maintaining, repairing, renewing and insuring said works.

If at any time any other municipal corporation, or pursuant to said Act, any railway or distributing company, or any other corporations or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and the involved Corporation or corporations in writing of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants as to the price to be paid, for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid, and to be paid by the Corporation, appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said works or any part thereof are not adequate for such supply, or if the supply of the Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of a municipal corporation taking power from the Commission at the time of such application without the written consent of such corporation.

In determining the quantity of power supplied to a municipal corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant, other than a municipal corporation, shall be computed as part of the quantity supplied to such corporation, but such corporation shall not be liable for payment for any portion of the power supplied. No power shall be supplied by the municipal corporation to any railway or distributing company without the written consent of the Commission. Power shall not be sold for less than the cost, and there shall be no discrimination as regards price and quantity.

7. It is hereby declared that the Commission is to be a trustee of all property held by the Commission under this agreement for the Corporation or corporations supplied by the Commission, but the Commission shall be entitled to a lien upon the said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporation and any other (if any) supplied by the Commission, having regard to the amounts paid by them respectively under the terms of this agreement, and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

8. If differences arise between corporations to which the Commission is supplying power, the Commission may upon application fix a time and place and hear all representations that may be made by the parties and the Commission shall, in a summary manner, when possible, adjust such differences and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a commissioner appointed under the *Act respecting Enquiries concerning Public Matters*.

9. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the Commission and the Corporation have respectively affixed their corporate seals and the hands of their proper officers.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

A. BECK, *Chairman*.
W. W. POPE, *Secretary*.

(Seal)

THE MUNICIPAL CORPORATION OF THE VILLAGE OF DUNDALK.

JOHN SINCLAIR, *Reeve*.
M. N. RINLEY, *Clerk*.

(Seal)

SCHEDULE "J."

This Indenture made in duplicate the day of , in the year of
our Lord

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called the
"Commission," party of the first part;

and

The Municipal Corporation of the Village of Flesherton, hereinafter
called the "Corporation," party of the second part.

Whereas, pursuant to an Act to provide for the transmission of electrical power to municipalities, known as *The Power Commission Act* and amendments thereto, the Corporation applied to the Commission for a supply of power, and the Commission furnished the Corporation with estimates of the total cost of such power, ready for distribution within the limits of the Corporation (and the electors of the Corporation assented to the by-laws authorizing the Corporation to enter into a contract with the Commission for such power).

1. Now therefore this indenture witnesseth that in consideration of the premises and of the agreement of the Corporation herein set forth, subject to the provisions of the said Act and amendments thereto, the Commission agrees with the Corporation:

(a) To reserve and deliver at the earliest possible date 75 h.p. or more of electrical power to the Corporation.

(b) At the expiration of reasonable notice in writing which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for.

(c) To use at all times first-class, modern, standard commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) To deliver commercially continuous twenty-four hour power every day in the year to the Corporation at the distribution bus bars in the Commission's sub-station within the Corporation's limits.

2. In consideration of the premises and of the agreements herein set forth, the Corporation agrees with the Commission:—

(a) To use all diligence by every lawful means within its power to prepare for the receipt and use of the power dealt with by this agreement so as to be able to receive power when the Commission is ready to deliver the same.

(b) To pay annually interest at rate payable by the Commission upon the Corporation's proportionate part (based on the quantity of electrical energy or power taken), of all moneys expended by the Commission on

capital account for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations, and other works necessary for the delivery of said electrical energy or power to the Corporation under the terms of this contract.

Also to pay an annual sinking fund instalment of such amount as to form at the end of thirty years, with accrued interest, a sinking fund sufficient to repay the Corporation's proportionate part, based as aforesaid, of all moneys advanced by the Province of Ontario for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations and other work necessary for the delivery of said electrical energy or power delivered to the Corporation under the terms of this contract. Also to pay the Corporation's proportionate part, based as aforesaid, of the cost of lost power and of the cost of operating, maintaining, repairing, renewing and insuring said generating plants, transformer stations, transmission lines, distributing stations and other necessary works. Subject to adjustment under Clause 6 of this agreement.

(c) The amounts payable under this contract shall be paid in twelve monthly instalments, in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bill remains unpaid for fifteen days the Commission may, in addition to all other remedies and without notice, discontinue the supply of power to the Corporation until said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisoes and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(d) To take electric power exclusively from the Commission during the continuance of this agreement.

(e) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement and of the said Act.

(f) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for it as herein provided whether it takes the same or not. When the highest average amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month;

(g) If the Corporation during any month takes more than the amount of power ordered and held in reserve for it, as determined by an integrated peak, or the highest average, for a period of twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve, such increased quantity of power in accordance with the terms and conditions of this contract.

(h) When the power factor of the highest average amount of power

taken for said twenty consecutive minutes falls below 90%, the Corporation shall pay for 90% of said power divided by the power factor.

(i) To use at all times first-class, modern, standard commercial apparatus and plant, to be approved by the Commission.

(j) To exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and of the Corporation.

3. This agreement shall remain in force for thirty years from date of the first delivery of power under this contract.

4. The power shall be alternating, three phase, having a periodicity of approximately sixty cycles per second and shall be delivered as aforesaid at a voltage suitable for local distribution.

(a) That the meters with their series and potential transformers shall be connected at the point of delivery.

(b) The maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the sub-station in the limits of the Corporation shall constitute the supply of all power involved herein and the fulfilment of all operating obligations hereunder, and when voltage and frequency are so maintained, the amount of power, its fluctuations, load factor, power factor, distribution as to phases and all other electric characteristics and qualities, are under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Corporation and take records at all reasonable hours.

6. The Commission shall at least annually adjust and apportion the amount or amounts payable by the municipal corporation or corporations for such power and such interest, sinking fund, cost of lost power and cost of generating, operating, maintaining, repairing, renewing and insuring said works.

If at any time any other municipal corporation, or pursuant to said Act, any railway or distributing company, or any other corporations or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and the involved corporation or corporations in writing, of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants as to the price to be paid, for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid, and to be paid by the Corporation, appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said works or any part thereof are not adequate for such supply, or if the supply of the Corporation

will be thereby injuriously affected, and no power shall be supplied within the limits of a municipal corporation taking power from the Commission at the time of such application without the written consent of such Corporation.

In determining the quantity of power supplied to a municipal corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant other than a municipal corporation, shall be computed as part of the quantity supplied to such corporation, but such corporation shall not be liable for payment for any portion of the power so supplied. No power shall be supplied by the municipal corporation to any railway or distributing company without the written consent of the Commission. Power shall not be sold for less than the cost and there shall be no discrimination as regards price and quantity.

7. It is hereby declared that the Commission is to be a trustee of all property held by the Commission under this agreement for the corporation or corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporation and any other (if any) supplied by the Commission, having regard to the amounts paid by them respectively under the terms of this agreement, and such other consideration as may appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

8. If differences arise between Corporations to which the Commission is supplying power, the Commission may upon application fix a time and place and hear all representations that may be made by the parties, and the Commission shall, in a summary manner, when possible, adjust such differences, and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a commissioner appointed under *The Act respecting Enquiries Concerning Public Matters*.

9. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the Commission and the Corporation have respectively affixed their corporate seals and the hands of their proper officers.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

A. BECK, *Chairman.*

W. W. POPE, *Secretary.*

MUNICIPAL CORPORATION OF THE VILLAGE OF FLESHERTON.

D. McTAVISH, *Reeve.*

W. J. BELLAMY, *Village Clerk.*

SCHEDULE "K."

This Indenture made in duplicate the _____ day of _____
in the year of our Lord,

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called the "Commission," party of the first part,

and

The Municipal Corporation of the Village of Shelburne, hereinafter called the "Corporation," party of the second part.

Whereas, pursuant to an Act to provide for the transmission of electrical power to municipalities known as the *Power Commission Act*, and amendments thereto, the Corporation applied to the Commission for a supply of power, and the Commission furnished the Corporation with estimates of the total cost of such power, ready for distribution within the limits of the Corporation (and the electors of the Corporation assented to the by-laws authorizing the Corporation to enter into a contract with the Commission for such power).

1. Now therefore this indenture witnesseth that in consideration of the premises and of the agreement of the Corporation herein set forth, subject to the provisions of the said Act and Amendments thereto, the Commission agrees with the Corporation:

(a) To reserve and deliver at the earliest possible date 300 h.p. or more of electrical power to the Corporation.

(b) At the expiration of reasonable notice in writing which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for.

(c) To use at all times first-class, modern, standard commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) To deliver commercially continuous 24-hour power every day in the year to the Corporation at the distribution bus bars in the Commission's sub-station within the Corporation's limits.

2. In consideration of the premises and of the agreement herein set forth, the Corporation agrees with the Commission:

(a) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement, so as to be able to receive power when the Commission is ready to deliver same.

(b) To pay annually, interest at rate payable by the Commission upon the Corporation's proportionate part (based on the quantity of electrical energy or power taken) of all moneys expended by the Commission on capital account for the acquiring of properties and rights, the acquiring

and construction of generating plants, transformer stations, transmission lines, distributing stations, and other works necessary for the delivery of said electrical energy or power to the Corporation under the terms of this contract.

Also to pay an annual sinking fund instalment of such amount as to form at the end of 30 years, with accrued interest, a sinking fund sufficient to repay the Corporation's proportionate part, based, as aforesaid, on all moneys advanced by the Province of Ontario, for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations and other work necessary for the delivery of said electrical energy or power, delivered to the Corporation under the terms of this contract. Also to pay the Corporation's proportionate part, based as aforesaid, of the cost of lost power, and the cost of operating, maintaining, repairing, renewing and insuring said generating plants, transformer stations, transmission lines, distributing stations and other necessary works. Subject to adjustment under Clause 6 of this agreement.

(c) The amounts payable under this contract shall be paid in twelve monthly payments, in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bill remains unpaid for fifteen days, the Commission may, in addition to all other remedies and without notice, discontinue the supply of power to the Corporation until said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisoes and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(d) To take electric power exclusively from the Commission during the continuance of this agreement.

(e) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement, and of the said Act.

(f) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for it as herein provided, whether it takes the same or not. When the highest average amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

(g) If the Corporation during any month takes more than the amount of power ordered and held in reserve for it, as determined by an integrated peak, or highest average, for a period of twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve such increased quantity of power, in accordance with the terms and conditions of this contract.

(h) When the power factor of the highest average amount of power taken for said twenty consecutive minutes falls below 90 per cent., the Corporation shall pay for 90 per cent. of said power divided by the power factor.

(i) To use at all times first-class, modern, standard commercial apparatus and plant, to be approved by the Commission.

(j) To exercise all due skill and diligence, so as to secure satisfactory operation of the plant and apparatus of the Commission and of the Corporation.

3. This agreement shall remain in force for thirty years from date of the first delivery of power under this contract.

4. The power shall be alternating, three-phase, having a periodicity of approximately 60 cycles per second, and shall be delivered as aforesaid at a voltage suitable for local distribution.

(a) That the meters, with their series and potential transformers, shall be connected at the point of delivery.

(b) The maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the sub-station in the limits of the Corporation shall constitute the supply of all power involved herein and the fulfilment of all operating obligations hereunder, and when voltage and frequency are so maintained the amount of power, its fluctuations, load factor, power factor, distribution as to phases and all other electric characteristics and qualities, are under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Corporation, and take records at all reasonable hours.

6. The Commission shall at least annually adjust and apportion the amount or amounts payable by the Municipal Corporation or Corporations for such power and such interest, sinking fund, cost of lost power and cost of generating, operating, maintaining, repairing, renewing and insuring said works.

If at any time any other Municipal Corporation, or pursuant to said Act, any railway or distributing company, or any other Corporations or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and the involved Corporation or Corporations in writing, of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants as to the price to be paid, for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid, and to be paid by the Corporation, appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said works or any part thereof are not adequate for such supply, or if the supply of the Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of a Municipal Corporation taking power from the Commission at the time of such application, without the written consent of such Corporation.

In determining the quantity of power supplied to a Municipal Corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant, other than a Municipal Corporation, shall be computed as part of the quantity supplied to such Corporation, but such Corporation shall not be liable for payment for any portion of the power so supplied. No power shall be supplied by the Municipal Corporation to any railway or distributing company without the written consent of the Commission. Power shall not be sold for less than the cost and there shall be no discrimination as regards price and quantity.

7. It is hereby declared that the Commission is to be a trustee of all property held by the Commission under this agreement for the Corporation or Corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporation and any other (if any), supplied by the Commission, having regard to the amounts paid by them respectively under the terms of this agreement, and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

8. If differences arise between Corporations to which Commission is supplying power, the Commission may, upon application, fix a time and place and hear all representations that may be made by the parties, and the Commission shall, in a summary manner, when possible, adjust such differences and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a Commissioner under the *Act respecting Enquiries concerning Public Matters*.

9. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the Commission and the Corporation have respectively affixed their corporate seals and the hands of their proper officers.

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

A. BECK, *Chairman*.

W. W. POPE, *Secretary*.

MUNICIPAL CORPORATION OF THE VILLAGE OF SHELBURNE.

HUGH FALCONER, *Reeve*.

Witness:

THOS. WHALLEY, *Clerk*.

SCHEDULE "L."

This Indenture made (in duplicate) the twenty-sixth day of August, in the year of our Lord one thousand nine hundred and fifteen.

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called the "Commission," party of the first part;

and

The Municipal Corporation of the Village of Victoria Harbour, hereinafter called the "Corporation," party of the second part.

Whereas, pursuant to *An Act to provide for transmission of Electrical Power to Municipalities*, the Corporation applied to the Commission for a supply of power, and the electors of the Corporation assented to a by-law authorizing the Corporation to enter into a contract with the Commission for such power.

1. Now therefore this indenture witnesseth that in consideration of the premises and of the agreements of the Corporation herein set forth, subject to the provisions of said Act and of the said contract, the Commission agrees with the Corporation:

(a) To reserve and deliver at the earliest possible date 50 h.p. or more of electric power to the Corporation.

(b) At the expiration of thirty days' notice in writing which may be given by the Corporation from time to time, during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for in blocks of 25 h.p. each up to the limit of the capacity of the Big Chute's Power Development.

(c) To use at all times first-class, modern, standard commercial apparatus and plant, and to exercise all due skill and diligence, so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) The power shall be delivered to the Corporation at approximately 2,200 volts and at approximately sixty cycles per second.

2. In consideration of the premises and of the agreements herein set forth, the Corporation agrees with the Commission:

(a) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement so as to be able to receive power when the Commission is ready to deliver same.

(b) Subject to the provisions of paragraph 2 (f) hereof, to pay the Commission sixteen dollars and fifty cents (\$16.50) per h.p. per annum for all power taken by the Corporation at the interswitching structure located on the Commission's transmission lines at the Village of Waubaushene.

Nothing herein contained shall bind the Commission to supply power on the demand of the Corporation after the capacity of the Big Chute's plant

has been reached, unless the Commission has power available or capable of development.

(c) To pay in addition annually, interest (at the same rate as paid by the Commission) upon the moneys expended by the Commission on capital account for the construction of transmission lines, the transformer station and equipment, and all other necessary works required for the delivery of power and transforming it from 22,000 to 2,200 volts.

Also to pay an annual part of the cost of the construction of said line, station and works so as to form in thirty years a sinking fund for the repayment of the moneys advanced by the Province of Ontario, in connection with this work.

Also to pay the Corporation's proportionate part of the cost of lost power, of operating, maintaining, repairing, renewing and insuring the said line, station and works.

(d) The amounts payable under this contract shall be paid in twelve monthly payments, in gold coin of the present standard of weight and fineness, at the office of the Commission at Toronto, and bills shall be rendered by the Commission on or before the 5th day and paid by the Corporation on or before the 15th day of each month. If any bill remains unpaid for fifteen days, the Commission may, in addition to all other remedies and without notice, discontinue the supply of power to the Corporation until said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisos and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(e) To take electric power exclusively from the Commission during the continuance of this agreement.

(f) To pay for three-fourths of the power ordered from time to time by the Corporation and held in reserve for it as herein provided, whether it takes the same or not. When the greatest average amount of power taken for any twenty consecutive minutes during any month shall exceed during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

If the Corporation during any month takes more than the amount of power ordered and held in reserve for it for twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve an additional block of power in accordance with the terms and conditions of this contract.

When the power factor of the greatest amount of power taken for said twenty consecutive minutes falls below 90%, the Corporation shall pay for 90% of said power divided by the power factor.

(g) To use at all times first-class, modern, standard commercial apparatus and plant, approved by the Commission.

(h) To exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and the Corporation.

3. This agreement shall remain in force until the date of expiration of the lease to the water rights on the Severn River of the Big Chute development, that is to say, until the tenth (10th) day of September in the year nineteen hundred and twenty-nine; providing the said lease is renewed by the Commission, then this agreement shall remain in force for thirty (30) years from the date of the first delivery of power thereunder.

4. The power shall be approximately 2,200 volts, 60 cycle, 3 phase, alternating commercially continuous twenty-four hour power every day in the year except as provided herewith, and shall be delivered by the Commission to the Corporation at the 2,200 volt terminals of the step-down transformers in the substation in the Corporation limits.

(a) That the meters with their series or potential transformers may be connected to the high tension side or low tension side of the transformers, or some connected to one side and some connected to the other, as the Commission may elect. That whenever connected at other than the point of measurement, their reading shall be subject to a correction and shall be corrected to give a reading such as would be obtained by instruments as if connected at the point of measurement. That such corrections shall be based upon tests made upon the step-down transformers and transmission lines by the Commission, or any other tests upon them acceptable to the Commission as to the efficiency, regulation, or any other constants of the transformers and transmission lines necessary for said correction, but that such tests, when made by the Commission, are to be made in the presence of the representatives or representative of the customer if it so desires.

(b) The maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the substation in the limits of the Corporation shall constitute the supply of all power involved herein and the fulfilment of all operating obligations hereunder; and when voltage and frequency are so maintained, the amount of the power, its fluctuations, load factor, power factor, distribution as to phases, and all other electric characteristics and qualities are under the sole control of the Corporation, their agents, customers, apparatus, appliances and circuits.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Corporation and take records at all reasonable hours.

6. In case the Commission should at any time or times be prevented from supplying said power, or any part thereof, or in case the Corporation shall at any time be prevented from taking said power, or any part thereof, by strike, lock-out, fire, invasion, explosion, act of God, or the King's enemies, or any other cause reasonably beyond their control, then the Commission shall not be bound to deliver such power during such times, and the Corporation shall not be bound to pay the price of said power during such time, but as soon as the cause of such interruption is removed, the Commission shall without any delay supply said power as aforesaid, and the Corporation shall take the same and shall be prompt and diligent in removing and overcoming such cause or causes of interruption.

7. If at any time any other municipal corporation, or pursuant to said Act, any railway or distributing company, or any other corporation or person,

applies to the Commission for a supply of power, the Commission shall notify the applicant and the Corporation in writing, of a time and place, and hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants as to the price to be paid, for equal quantity of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid, and to be paid by the Corporation, appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said line is not adequate for such supply, or if the supply of the Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of a municipal corporation taking power from the Commission at the time of such application without the written consent of such corporation.

In determining the quantity of power supplied to a municipal corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant other than a municipal corporation, shall be computed as part of the quantity supplied to such corporation, but such corporation shall not be liable to pay for the power so supplied, or otherwise in respect thereof. In order to prevent discrimination by the municipal corporation, no power shall be supplied by the municipal corporation to any railway or distributing company or person outside the corporation without the written consent of the Commission, but the Corporation may sell power to any person or persons or manufacturing companies inside the limits of the corporation, but such power shall not be sold for less than the cost and without discrimination as regards price and quantity.

8. If differences arise between corporations to whom the Commission is supplying power, the Commission may upon application fix a time and place to hear all representations that may be made by the parties, and the Commission shall, in a summary manner, when possible, adjust such differences, and such adjustment shall be final. The Commission shall have all the power that may be conferred upon a commissioner appointed under *The Act respecting Enquiries Concerning Public Matters*.

9. If differences arise between the Corporation and the Commission, the Lieutenant-Governor in Council may, upon application, fix a time and place to hear all representations that may be made by the parties, and the Lieutenant-Governor in Council shall, in a summary manner, when possible, adjust such differences, and such adjustment shall be final. The Lieutenant-Governor in Council shall have all the powers that may be conferred upon a commissioner appointed under *The Act respecting Enquiries Concerning Public Matters*.

10. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the Commission and the Corporation have respectively affixed their corporate seals and the hands of their proper officers.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

A. BECK, *Chairman.*

W. W. POPE, *Secretary.*

THE MUNICIPAL CORPORATION OF THE VILLAGE OF VICTORIA
HARBOUR.

JEROME DUCKWORTH, *Reeve.*

E. B. BROWNE, *Clerk.*

(Seal.)

SCHEDULE "M."

This indenture made this eleventh day of October, one thousand nine hundred and fifteen.

Between

The Hydro-Electric Power Commission of Ontario, hereinafter called the "Commission," party of the first part;

and

The Municipal Corporation of the Police Village of Holstein, hereinafter called the "Corporation," party of the second part.

Whereas the Corporation under the provisions of the *Power Commission Act* and amendments thereto, Revised Statutes of Ontario, Chapter 39 has applied to the Commission for a supply of power, and has passed a by-law No. 304, passed the 10th day of August, 1915, to authorize the execution of an agreement therefor.

Now therefore this indenture witnesseth that in consideration of the premises and of the agreement of the Corporation herein set forth, subject to the provisions of the said Act and amendments thereto, the parties hereto agree each with the other as follows:

1. The Commission agrees:

(a) To reserve and deliver at the earliest possible date fifty (50) h.p., or more, of electrical power to the Corporation.

(b) At the expiration of reasonable notice, in writing, which may be given by the Corporation from time to time during the continuance of this agreement, to reserve and deliver to the Corporation additional electric power when called for;

(c) To use at all times first-class modern, standard commercial apparatus and plant, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Corporation.

(d) To deliver commercially continuous twenty-four (24) hour power every day in the year to the Corporation at the distribution bus bars in the Commission's sub-station within the Corporation's limits.

2. The Corporation agrees:

(a) To use all diligence by every lawful means in its power to prepare for the receipt and use of the power dealt with by this agreement so as to be able to receive power when the Commission is ready to deliver same.

(b) To pay annually in twelve (12) equal monthly instalments, interest upon its proportionate part (based on the quantity of electrical energy or power taken) of all moneys expended by the Commission on capital account for the acquiring of properties and rights, the acquiring and construction of generating plants, transformer stations, transmission lines, distributing stations, and other works necessary for the delivery of said electrical energy or power to the Corporation under the terms of this contract.

To pay an annual sum for its proportionate part of all moneys expended by the Commission on capital account for the acquiring of the said properties and rights, and the cost of the said construction, so as to form in thirty (30) years a sinking fund for the retirement of securities issued by the Province of Ontario.

Also to bear its proportionate part of the line loss, and pay its proportionate part of the cost to operate, maintain, repair, renew, and insure the said generating plants, transformer stations, transmission lines, distributing stations, and other necessary works.

All payments under this clause shall be subject to adjustment under paragraph 6.

(c) The amounts payable in accordance with clause 2 (b) shall be paid in gold coin of the present standard of weight and fineness, at the offices of the Commission at Toronto. Bills shall be rendered by the Commission on or before the 5th day, and paid by the Corporation on or before the 15th day of each month. If any bills remain unpaid for fifteen days, the Commission may, in addition to all other remedies, and without notice, discontinue the supply of power to the Corporation until said bill is paid. No such discontinuance shall relieve the Corporation from the performance of the covenants, provisoes and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(d) To take electrical power exclusively from the Commission during the continuance of this agreement.

(e) To pay for three-fourths of the power ordered from time to time by the Corporation, and held in reserve for it, as herein provided; whether it takes the same or not. When the highest average amount of power taken for any twenty (20) consecutive minutes during any month exceeds during the twenty consecutive minutes three-fourths of the amount ordered by the Corporation and held in reserve, then the Corporation shall pay for this greater amount during the entire month.

If the Corporation during any month takes more than the amount of power ordered and held in reserve for it, as determined by an integrated peak, or

the highest average, for a period of twenty consecutive minutes, the taking of such excess shall thereafter constitute an obligation on the part of the Corporation to pay for, and on the part of the Commission to hold in reserve, such increased quantity of power in accordance with the terms and conditions of this contract.

When the power factor of the highest average amount of power taken for said twenty consecutive minutes falls below 90 per cent. the Corporation shall pay for 90 per cent. of said power divided by the power factor.

(f) To use at all times first-class, modern standard commercial apparatus and plant, to be approved by the Commission, and to exercise all due skill and diligence so as to secure satisfactory operation of the plant and apparatus of the Commission and of the Corporation.

(g) To co-operate by all means in its power at all times with the Commission to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement, and of the said Act.

3. This agreement shall remain in force for thirty (30) years from the date of the first delivery of power under this contract.

4. The power shall be alternating, three-phase, having a periodicity of approximately 60 cycles per second, and shall be delivered as aforesaid at a voltage suitable for local distribution.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant, and property of the Corporation, and take records at all reasonable hours.

6. The Commission shall, at least annually, adjust and apportion the amount or amounts payable by the Municipal Corporation, or corporations, for such power and such interest, sinking fund, cost of lost power, and cost of generating, operating, maintaining, repairing, renewing, and insuring said works.

7. It is hereby declared that the Commission is to be a trustee of all property held by the Commission under this agreement for the Corporations and other municipal corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporations and other municipal corporations, supplied by the Commission, having regard to the amounts paid by them, respectively, under the terms of this agreement, and such other considerations as may appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

8. If at any time any other municipal corporation, or pursuant to said Act, any railway or distributing company, or any other corporation, or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and the Corporation, in writing, of a time and place to hear all representations that may be made as to the terms and conditions for such supply.

Without discrimination in favour of the applicants as to the price to be paid for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred and paid, and to be paid by the Corporation, appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

No such application shall be granted if the said works, or any part thereof, are not adequate for such supply, or if the supply of the Corporation will be thereby injuriously affected, and no power shall be supplied within the limits of a municipal corporation taking power from the Commission at the time of such application without the written consent of such Corporation.

In determining the quantity of power supplied to a municipal corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant, other than a municipal corporation shall be computed as part of the quantity supplied to such corporation, but such corporation shall not be liable for payment for any portion of the power supplied. No power shall be supplied by the municipal corporation to any railway or distributing company without the written consent of the Commission, but the Corporation may sell power to any person or persons, or manufacturing companies within the limits of the Corporation, but such power shall not be sold for less than cost, neither shall there be any discrimination as regards price and quantity.

9. If differences arise between corporations to which the Commission is supplying power, the Commission may, upon application, fix a time and place and hear all representations that may be made by the parties, and the Commission shall, in a summary manner, when possible, adjust such differences, and such adjustment shall be final. The Commission shall have all the powers that may be conferred upon a commissioner appointed under the *Act respecting Enquiries concerning Public Matters*.

10. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the Commission and the Corporation have, respectively, affixed their corporate seals, and the hands of their proper officers.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

A. BECK, *Chairman*.

W. W. POPE, *Secretary*.

(Seal.)

MUNICIPAL CORPORATION OF THE POLICE VILLAGE OF HOLSTEIN.

RICHARD IRWIN, *Chairman*.

R. M. TRIBE, *Inspecting Trustee*.

L. B. NICHOLSON, *Secretary*.

(Seal.)

"SCHEDULE "N."

This indenture made this first day of November, A.D. one thousand nine hundred and fourteen.

Between

The Hydro-Electric Power Commission of Ontario, acting herein on its own behalf and with the approval of the Lieutenant-Governor in Council (hereinafter called the Commission), party of the first part;

and

The Municipal Corporation of the Police Village of Williamsburg (hereinafter called the Corporation), party of the second part.

Whereas pursuant to *An Act to Provide for Transmission of Electrical Power to Municipalities*, and the amendments thereto, the Corporation applied to the Commission to transmit and supply such power, and the Commission has entered into contracts with a company or companies for the supply of such power at the prices set forth in the schedule, hereto attached, and the Commission has furnished the Corporation with estimates, as shown in the schedule of the total cost of such power, and the electors of the Corporation assented to by-laws authorizing the Corporation to enter into a contract with the Commission for such power, and the Commission have estimated the line loss and the cost to construct, operate, maintain, repair, renew and insure a line to transmit such power to the Corporation, and have apportioned the part of such cost to be paid by each Corporation as shown in said schedule.

Now therefore this indenture witnesseth that in consideration of the premises and of the agreements of the Corporation herein set forth, subject to the provisions of said Act and the amendments thereto, and of the said contracts subject to any variations thereof by the Corporation, the Commission agrees with the Corporation respectively:

1. (a) To construct a line to transmit the quantities of electric power, shown in column 2 of the said schedule, to the Corporation shown in column 1 respectively.

(b) On the 15th day of May, 1915, or on any earlier day on which the Commission shall be prepared to supply said power in quantities set forth in column 2 of said schedule, to the Corporation within the limits thereof, ready for distribution at approximately the number of volts set forth in column 4 of the said schedule, and approximately 60 cycles per second frequency.

(c) At the expiration of three months' written notice, which may be given by the Corporation from time to time during the continuance of this agreement, to supply from time to time to the Corporation in blocks of not less than 10 h.p. each, additional power until the total amount so supplied shall amount to 15,000 horse power, or such further amount as the Commission may be able and willing to supply.

(d) To use at all times first-class, modern, standard commercial apparatus and plant and to exercise all due skill and diligence so as to secure the most perfect operation of the plant and apparatus of the Corporation.

In consideration of the premises and of the agreements herien set forth each of the Corporations for itself, and not one for the other, agrees with the Commission:

2. (a) Subject to the provisions of paragraph 2 (g) hereof, to pay to the Commission for the quantities of power shown in column 2 of said schedule to be supplied as aforesaid from the date when the Commission notifies the Corporation that it is ready to supply such power, and for all additional power held in reserve upon any of the above mentioned notices from the respective dates thereof until the termination of this agreement, the price set forth in column 3 of said schedule in twelve monthly payments, in gold coin of the present standard of weight and fineness, and bills shall be rendered by the Commission on or before the fourth and paid by the Corporation on or before the fifteenth of each month. If any bill remains unpaid for fifteen days, the Commission may, in addition to all other remedies and without notice, discontinue the supply of such power to the Corporation in default until said bill is paid. No such discontinuance shall relieve the Corporation in default from the performance of the covenants, provisoes, and conditions herein contained. All payments in arrears shall bear interest at the legal rate.

(b) To take electric power exclusively from the Commission during the continuance of this agreement; provided, if the Commission is unable to supply the said power as quickly as required, the Corporation may obtain the supply otherwise until the Commission has provided such supply, thereupon the Corporation shall immediately take from the Commission; and the Corporation may generate, store or accumulate electric power for emergencies, or to keep down the peak load of the power taken from the Commission; and nothing herein contained shall affect existing contracts between the Corporation and other parties for a supply of electric power, but the Corporation shall determine said contracts at the earliest possible date.

(c) To pay, annually, interest at four per cent. per annum upon its proportionate part of the moneys expended by the Commission on capital account for the construction of the said line, transformer stations and other necessary works, shown, respectively, in column 6 of said schedule, subject to adjustment under paragraph 9.

(d) To pay an annual sum for its proportionate part of the cost of the construction of said line, stations, and works, shown, respectively, in column 6 of said schedule, subject to adjustment under paragraph 9, so as to form in thirty years a sinking fund for the retirement of the securities to be issued by the Province of Ontario.

(e) To bear its proportionate part of the line loss and pay its proportionate part of the cost to operate, maintain, repair, renew and insure the said lines, stations and work, shown, respectively, in column 7 of said schedule subject to adjustment under paragraph 9.

(f) To keep, observe and perform the covenants, provisoes and conditions set forth in said contracts, intended by the Commission and the company to be kept and observed and performed.

(g) To pay as a minimum for three-fourths of the power to be supplied at said date or of the power held in reserve upon any of the said notices, whether the said power is taken or not; and when the greatest amount of

power taken for twenty consecutive minutes in any month shall exceed during such twenty minutes three-fourths of the amount to be supplied and held in reserve to pay for this greater amount during that entire month; the amount payable for a month being one-twelfth part of the annual rate applicable to the horse power in question. When the power factor of the greatest amount of power taken for said twenty minutes falls below 90 per cent., the Corporation shall pay for 90 per cent. of said power divided by the power factor.

(h) To take no more power than the amount to be supplied and held in reserve at said date and upon said notices, as per paragraph 1 (c).

(i) To use at all times first-class, modern, standard commercial apparatus and plant to be approved by the Commission.

(j) To exercise all due skill and diligence so as to secure the most perfect operation of the plant and apparatus of the Commission and the company.

3. If, as herein provided, the said contracts are continued until nineteen hundred and forty-two (1942), this agreement shall remain in force until that date.

4. (a) Said power shall be three-phase, alternating, commercial continuous twenty-four hour power every day of the year, except as provided in paragraph 6 hereof, and shall be measured by curve-drawing meters, subject to test as to accuracy by either party hereto.

(b) The maintenance by the Commission of approximately the agreed voltage at approximately the agreed frequency at the point of delivery to the Corporation shall constitute the supply and the holding in reserve of all power involved herein, and the fulfilment of all operating obligations hereunder; the amount of the power, its fluctuations, load factor, power factor, distribution as to phases, and all other electric characteristics and qualities being under the sole control of the Corporation, its agents, customers, apparatus, appliances and circuits.

5. The engineers of the Commission, or one or more of them, or any other person or persons appointed for this purpose by the Commission, shall have the right from time to time during the continuance of this agreement to inspect the apparatus, plant and property of the Corporation, and take records at all reasonable times on giving to the Corporation six hours' notice of the intention to make such inspection. The Corporation shall have a like right, on giving a like notice, to inspect the apparatus, plant and property of the Commission.

6. In case the Commission or the Company shall at any time or times be prevented from supplying said power, or any part thereof, or in case the Corporation shall at any time be prevented from taking said power, or any part thereof, by strike, lock-out, riot, fire, invasions, explosion, act of God, or the King's enemies, or any other cause reasonably beyond their control, then the Commission shall not be bound to deliver such power during such time, and the Corporation shall not be bound to pay the price of said power at the point of delivery by the Company during such time, but the Corporation shall continue to make all other payments, but as soon as

the cause of such interruption is removed the Commission shall without any delay supply said power as aforesaid, and the Corporation shall take the same, and each of the parties hereto shall be prompt and diligent in removing and overcoming such cause or causes of interruption.

7. If, and so often as, any interruption shall occur in the service of the Company, due to any cause or causes other than those provided for by the next preceding paragraph hereof, the Commission shall pay to the Corporation as liquidated and ascertained damages, and not by way of penalty, their respective proportionate shares of whatever sum is payable to the Commission by reason of such interruption; and when the amount thereof has been settled, such sum may be deducted from any moneys payable by the Corporation to the Commission, but such right of deduction shall not in any case delay the said monthly payments, nor shall the Commission be subject to any other liability for any non-delivery.

8. In case any municipal corporation, or any person, firm or corporation which shall contract with the Commission or with any municipal corporation for a supply of power furnished to the Commission by the Company shall suffer damages by the act or neglect of the Company, and such municipal corporation, person, firm or corporation would, if the Company had made the said contracts directly with them, have had a right to recover such damages or commence any proceedings or any other remedy, the Commission shall be entitled to commence any such proceedings or bring such action for or on behalf of such municipal corporation, person, firm or corporation, and notwithstanding any Statute, decision or rule of law to the contrary, the Commission shall be entitled to all the rights and remedies of such municipal corporation, person, firm or corporation, including the right to recover such damages, but no action shall be brought by the Commission until such municipal corporation, person, firm or corporation shall have agreed with the Commission to pay any costs that may be adjudged to be paid if such proceedings or action is unsuccessful. The rights and remedies of any such municipal corporation, person, firm or corporation shall not be hereby prejudiced.

9. The Commission shall at least annually adjust and apportion the amounts payable by municipal corporations for such power and such interest, sinking fund, line loss, and cost of operating, maintaining, repairing, renewing and insuring the line and works.

10. (a) If at any time, any other municipal corporation, or, pursuant to said Act, any railway or distributing company or any other corporation or person, applies to the Commission for a supply of power, the Commission shall notify the applicant and the corporation, party hereto, in writing, of a time and place, and hear all representations that may be made as to the terms and conditions for such supply.

(b) Without discrimination in favour of the applicants as to the price to be paid, for equal quantities of power, the Commission may supply power upon such terms and conditions as may, having regard to the risk and expense incurred, and paid, and to be paid by the Corporation, party hereto, appear equitable to the Commission, and are approved by the Lieutenant-Governor in Council.

(c) No such application shall be granted if the said line is not adequate for such supply, or if the supply of the Corporation, party hereto, will be thereby injuriously affected, and no power shall be supplied within the limits of a municipal corporation taking power from the Commission at the time of such application, without the written consent of such corporation.

(d) In determining the quantity of power supplied to a municipal corporation, the quantity supplied by the Commission within the limits of the Corporation to any applicant, other than a municipal corporation, shall be computed as part of the quantity supplied to such corporation, but such corporation shall not be liable to pay for the power so supplied, by any municipal corporation, to any railway or distributing company, without the written consent of the Commission.

11. It is hereby declared that the Commission is to be a trustee of all property held by the Commission under this agreement, for the Corporation and other municipal corporations supplied by the Commission, but the Commission shall be entitled to a lien upon said property for all moneys expended by the Commission under this agreement and not repaid. At the expiration of this agreement, the Commission shall determine and adjust the rights of the Corporation and other municipal corporations, supplied by the Commission, having regard to the amounts paid by them, respectively, under the terms of this agreement, and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

12. Each of the Corporations agree with the other:

(a) To take electric power exclusively from the Commission during the continuance of this agreement, subject to the provisoes above set forth in paragraph 2 (b).

(b) To co-operate, by all means in its power, at all times with the Commission, to increase the quantity of power required from the Commission, and in all other respects to carry out the objects of this agreement and of the said Act.

13. If differences arise between the Corporations, the Commission may, upon application, fix a time and place to hear all representations that may be made by the parties, and the Commission shall, in a summary manner, when possible, adjust such differences, and such adjustments shall be final. The Commission shall have all the powers that may be conferred upon a commissioner appointed under the *Act respecting Enquiries concerning Public Matters*.

14. This agreement shall extend to, be binding upon, and enure to the benefit of the successors and assigns of the parties hereto.

In witness whereof the Commission and the Corporation have respectively affixed their corporate seals and the hands of their proper officers.

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO.

A. BECK, *Chairman*.

W. W. POPE, *Secretary*.

POLICE VILLAGE OF WILLIAMSBURG.

ORLIN BECKER, *Secretary*.

P. E. BECKSTEAD, *Chairman*.

E. C. MERKLEY, *Inspecting Trustee*.

SCHEDULE

Column	1	2	3	4	5	6	7
Name of Municipal Corporation		Quantity of Power applied for in H.P.	Cost of Power at point of delivery to Com- mission.	No. of Volts.	Estimate maximum cost of power ready for distribution in Municipality.	Estimate proportionate part of cost to con- struct trans. line, transformer station and works for nominally .....H.P., with total capacity of	Estimate proportionate part of line loss and of part cost of to operate, maintain, repair, renew and insure transmission line, trans- former station works for nominally H.P., with a capacity of .....H.P.
Brockville	1,000 H.P.	Then for all power taken up to 10,000 H.P. or over \$11.00 per H.P. \$14.00 for not less than 2,000 H.P. Then for all power taken up to 4,000 H.P., \$13.40 per H.P. Then for all power taken up to 6,000 H.P., \$12.50 per H.P. Then for all power taken up to 8,000 H.P., \$12.00 per H.P. Then for all power taken up to 10,000 H.P., \$11.50 per H.P.		13,200	\$24 04	\$76,950 00	\$7,077 00
Prescott	300 H.P.			13,200	24 54	30,594 00	1,838 00
Chesterville	50 H.P.			4,400	35 00	10,224 00	487 00
Winchester	100 H.P.			4,400	24 00	7,280 00	638 00
Williamsburg	20 H.P.			4,000	34 66 (without Sinking Fund)	3,522 00	272 00

The Legislature also passed the Act set out hereafter with reference to the "Public Development of Water Power at Niagara Falls."

An Act respecting the Public Development of Water Power in the vicinity of Niagara Falls.

Assented to 27th April, 1916.

WHEREAS the demand for the supply of electrical power or energy ^{Preamble.} in the district which may be served by power from the vicinity of Niagara Falls has so greatly increased that in order to obtain an adequate supply to meet the present and future demands of the municipalities interested or that may be interested, it is necessary that new sources of power should be developed; and whereas the existing development works at Niagara Falls are inadequate for the development and supply of the required amount of power, the quantity of power now generated by them and available for use in Canada being exhausted; and whereas it is desirable that the work of development should be carried on upon an adequate scale in order to utilize to the fullest possible extent the available supply of water which may be diverted from the Niagara River under the terms of the treaty between the United States of America and His Majesty, the King; and whereas the Hydro-Electric Power Commission of Ontario, after investigation by its engineers, has reported to the Government upon a scheme for the development of a supply of power from the Niagara River and its tributaries, and has prepared estimates of the cost thereof; and whereas there has been a general demand upon the part of the inhabitants of the said municipalities that the Government of Ontario should develop, through the Commission, power sufficient to meet the present and future requirements of the municipalities which it is possible to serve from the neighborhood of Niagara Falls, and that in the meantime the Commission should procure on the best terms available such additional power as may be necessary to supply the requirements of the municipalities and furnish the same to the municipalities at the average cost of all the power supplied to the municipalities under Contract with the Commission; and whereas it is desirable that the said work of development should be undertaken and carried out as economically, efficiently, and expeditiously as possible, taking into consideration the financial and other conditions arising out of the present war, and to this end that it should be conducted by the Commission, and under the authority and direction of the Government of Ontario, acting for and on behalf of the municipalities which may be supplied with power from such development;

Therefore His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario enacts as follows:—

1. This Act may be cited as *The Ontario Niagara Development Act*. Short title.

2. In this Act—

(a) "Commission" shall mean Hydro-Electric Power Commission of Ontario; Interpretation.
tion.
"Commission."

"Government."

- (b) "Government" shall mean Lieutenant-Governor in Council acting for and on behalf of the Province of Ontario;

Powers which the Crown may confer upon the Commission.

Entering on and laying out land.

Acquiring options and making contracts for purchase of lands.

Constructing works, etc.

Development works.

General powers.

Rev. Stat. c. 39.

Cost to be defrayed out of appropriation.

Payments to Commission.

Special account to be opened.

3. The Government may authorize the Commission to—

- (a) Enter upon, survey and lay out, all such lands, water, water privileges and water powers as may be required for the construction of the works hereinafter mentioned;
- (b) Acquire options upon and enter into preliminary contracts for the purchase of land for sites, right-of-way, the location of buildings, plant, works, machinery and appliances required for the works hereinafter mentioned;
- (c) Construct, erect, maintain and operate works for the purpose of diverting the waters of the Niagara River, Welland River, and tributary waters, or any of them, and conveying the same by aqueduct, conduit or canal, or in any other manner, from any point on the Welland River, or on the Niagara River, above the Cataract, and discharging such waters into the Niagara River;
- (d) Construct, erect, maintain and operate at or in the vicinity of such place of discharge, works, plant, machinery and appliances for the use of the waters so taken and diverted in the development of a water power for the production of electrical or pneumatic power or energy;
- (e) For such purposes, exercise all powers and enforce all rights which may be exercised and enforced by the Commission when taking land or other property in the exercise of powers conferred by or under *The Power Commission Act*.

4.—(1) The cost of the construction and maintenance of the works authorized by this Act shall be defrayed out of such money as may, from time to time, be appropriated by the Legislature for that purpose, and the works which may be authorized under section 3 shall be carried out and constructed as far as possible in such a manner that an appropriation made in any one fiscal year shall not be exceeded by the cost of the work to be carried out in that year.

(2) The Government may direct the Treasurer of Ontario from time to time to pay over to the Commission out of such sums, any sums which may be required to defray the cost of the works carried on by the Commission under this Act, and all such sums shall be duly accounted for as hereinafter provided.

5.—(1) Upon receiving the authority provided for by section 4, the Commission shall open an account to be styled "The Niagara Power Development Works Account," and such account shall contain an accurate and detailed statement:—

(a) Of all sums received by the Commission from the Government, for the purposes of the works hereby authorized; and

(b) An accurate and detailed statement of the cost of the work, including the services of the engineers, surveyors, and other officers of the Commission, and such proportion of the expenses of the administration of the Commission as may be fixed by Order-in-Council as fairly chargeable to the works undertaken and operated under the provisions of this Act.

(2) The Government may appoint an auditor whose duty it shall ^{Auditors.} be, by himself or his deputy, to examine, check and audit all accounts chargeable against the account mentioned in subsection 1, and certify them before payment thereof, and the auditor, or his deputy, shall countersign all cheques issued against the said account.

(3) The account shall be examined and audited at least once in and ^{Annual} for every fiscal year by a chartered accountant nominated by the Govern- ^{audit.} ment, who shall make his report to the Government thereon.

(4) The Government shall cause a full and detailed statement of the ^{Annual} operations carried on under the authority of this Act, and of all the ^{statement to} receipts and expenditures on account thereof, during the last preceding ^{Assembly.} fiscal year, together with the report mentioned in subsection 3, to be laid before the Assembly within fifteen days after the opening of each session.

6.—(1) Until an adequate supply of power from the works author- ^{Provisional} ized by this Act can be developed and transmitted to the municipalities. ^{arrange-} the Commission, with the approval of the Government, may procure ^{ments for} upon the best terms available a supply of such additional power as may ^{supply.} be necessary to meet the requirements of the municipalities over and above the 100,000 h.p. supplied under the terms of the contract heretofore entered into between the municipalities and the Commission, and such additional power shall be furnished to the municipalities at the average cost of all the power supplied to the municipalities under contract with the Commission for the supply of power from Niagara Falls and the vicinity.

(2) The additional cost to the municipalities of the power procured ^{Additional} under the authority of section 1, shall be included in the price per h.p. ^{cost—ad-} payable by a municipal corporation under the terms of the contract ^{justment of.} entered into with the Commission, and shall be annually adjusted and apportioned by the Commission as provided by *The Power Commission* ^{Rev. Stat.} ^{c. 39.} *Act.*

7. The exercise of the powers, which may be conferred by or under the authority of this Act, or of any of them, shall not be deemed to be a making use of the waters of the Niagara River to generate electric or pneumatic power within the meaning of any stipulation or condition contained in any agreement entered into by the Commissioners for the Queen Victoria Niagara Falls Park. ^{Extent of} ^{operation} ^{of Act.}

An Act was also passed to regulate the use of the waters of the Province of Ontario for power development purposes.

An Act to regulate the use of the Waters of the Province of Ontario for Power Development Purposes.

Assented to 27th April, 1916.

HIS MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

- Short title. **1.** This Act may be cited as *The Water Powers Regulation Act, 1916.*
- Interpre-
tation. **2.** In this Act,
- “Power.” (a) “Power” shall mean and include hydraulic, electrical, or pneumatic power or energy;
- “Owner of
a water
power.” (b) “Owner of a water power” shall mean and include every municipal corporation, company, firm or individual being or claiming to be the owner, lessee, licensee, occupant, tenant, or assignee of a right to use any of the waters of Ontario for the purpose of generating hydraulic, electrical, or pneumatic power or energy under any grant, lease or license from the Crown, or any person, or under contract with, or franchise from any public body representing the Crown or the Province of Ontario or under the general law or any special Act of this Legislature or otherwise;
- “Inspector.” (c) “Inspector” shall mean a commission, public body, or person designated by the Lieutenant-Governor in Council to act as Inspector under this Act, and shall include the officers, agents and servants of the Inspector employed and acting under the authority and direction of such Inspector;
- “Works.” (d) “Works” shall mean and include every dam, wing dam, forebay, gate, rack, canal, conduit, pipe, aqueduct, penstock, tunnel, and every other work which has been or may be constructed or used for or in connection with the control or diversion of water and the conveying of it to a power house or other place at which power may be generated; and all buildings, structures, plant, machinery, appliances and other works and things now or hereafter used for or appurtenant to the production and generation of power;
- “Regulations.” (e) “Regulations” shall mean regulations made by the Lieutenant-Governor in Council under the authority of this Act.
- Duty of
owner as
to use of
water. **3.** It shall be the duty of every owner of a water power to ensure as far as possible the economical and efficient use of the water used by him.

4. The Lieutenant-Governor in Council may appoint an Inspector ^{Appointment of} or Inspectors who may, in addition to the powers hereinafter mentioned ^{Inspector.} when required by the Lieutenant-Governor in Council so to do,

- (a) At all reasonable times enter upon any works, and examine and ^{Inspection.} inspect the same;
- (b) Take such measurements and tests as may be necessary from ^{Measure-} time to time in order to determine or to fix, as the case may ^{ments and} tests. be, in respect of the owner of any water power :
 - (i) The quantity of water used, permitted to be used or available for use;
 - (ii) Operating head and head losses;
 - (iii) Electrical and hydraulic efficiency of main or auxiliary machinery or of any other portion of the works, or of the works as a whole;
 - (iv) The amount of power developed, permitted to be developed, or available for development;
 - (v) Fix in terms of cubic feet per second the amount of water necessary to use in order to develop or generate any amount of horse-power or to exercise any water rights for any purpose;
- (c) Require the production of books, records, charts, readings, ^{Production} maps, plans, load curves and all other documents and re- ^{of records,} cords pertaining to the matters to be investigated, enquired ^{etc.} into or determined under the provisions of this Act;
- (d) If it appears to him that the water permitted to be used is not ^{Ordering} being utilized with a proper degree of efficiency or economy, ^{alterations} or that the works or any part of the works are so constructed, ^{in works,} or are of such a type, or have so depreciated that the water cannot be used with a proper degree of efficiency or economy, after giving the interested parties a reasonable opportunity to be heard, order the water to be used, or the machinery or the works or any part of them, to be replaced or removed, altered, or reconstructed as the case may be, in such manner or to such an extent as may be necessary to secure the proper degree of efficient and economical use of the water; and
- (e) If any order so made is not carried out within a reasonable ^{Shutting off} time, enter upon the works and, at the expense of the owner ^{water or} of a water power, shut off or reduce the supply of water or ^{closing} close the works or any part thereof in such a manner as to ^{works.} prevent further use until such order has been obeyed.

Appeal to
Lieutenant-
Governor
in Council.

5.—(1) Where an order made by the Inspector calls for alterations, repairs or improvements in the works there may be an appeal from the order of the Inspector to the Lieutenant-Governor in Council, and the Lieutenant-Governor in Council may make such order in the premises as may be deemed meet, which order shall be final.

Reference
to deter-
mine com-
pensation
where owner
not com-
mercially
benefited
by altera-
tions, etc.

(2) Upon such appeal, if the Lieutenant-Governor in Council is of the opinion that the additions, alterations or improvements required to be made in the works will be of material public advantage, by reason of the more efficient or economical use of the water, and that the owner of the water power will not presently receive a corresponding commercial advantage from such alterations or improvements, the Lieutenant-Governor in Council may direct a reference to determine what compensation, if any, should be made to the owner of the water power by reason of his being compelled to make such additions, alterations or improvements; and upon such reference all the circumstances shall be taken into account and if the referee is of opinion that the owner is entitled to compensation the referee may fix the amount thereof at such sum as he may deem just and reasonable, and upon the owner carrying out the order of the Inspector or of the Lieutenant-Governor in Council, the amount so awarded shall be payable to the owner in the same manner as a judgment recovered against the Crown in any court in Ontario.

Duty of
owner as to
inspection.

6. It shall be the duty of the owner of a water power, subject to the right of appeal hereinbefore given, to obey at all times the orders of the Inspector and to afford every facility for carrying out this Act and the regulations, and every owner of a water power who neglects or refuses to carry out any such order, or who obstructs or hinders or delays the Inspector or refuses to furnish him with such information and records as he may require, shall incur a penalty of not less than \$300 nor more than \$2,000, and each and every day on which such offence is committed or continued shall be deemed to create a separate offence.

Penalty.

Fixing
quantity of
water to
be taken
in exercise
of rights.

7. Where any lease, license, Order-in-Council or other instrument or any general or special statutory provision confers or purports to confer the right to develop or generate power measured expressly or impliedly in horsepower, or where any such instrument or provision confers or purports to confer a right of division or use of water defined wholly or in part by the character, location or dimensions of works, the Inspector may fix in terms of cubic feet per second the amount of water which it is necessary to use in order to develop or generate such power or to exercise such right, having regard to the location of the works and to all the circumstances of the case, and to the degree of efficiency which the owner of the water power should be required to maintain in the premises.

Submission
and
approval
of plans.

8. Every owner of a water power, before proceeding with the construction of any works or any alteration or extension of existing works or with the purchase or installation of new works, shall submit to an Inspector plans and specifications showing the details of the proposed construction, alteration or extension or of the new works proposed to be

purchased or installed, and he shall not proceed therewith or let contracts therefor until such plans and specifications have been approved by the Inspector.

9.—(1) Where the rights of the owner of a water power to use water for the purpose of generating power do not appear to be expressly or impliedly limited by any stipulation as to the quantity of water to be used or as to the amount of horsepower which may be generated or otherwise, and the Lieutenant-Governor in Council deems it desirable in the public interest that such rights should be specifically limited and defined, he may direct the Inspector to enquire and report as to (1) the amount of power which the owner of a water power is authorized to generate under any contract, lease, license or other instrument, or under any general or special Act of this Legislature or otherwise, and (2) as to the quantity of water which it is necessary, having due regard to efficiency and economy in development, to use for the purpose of generating such amount of power, and upon such report the Lieutenant-Governor in Council may fix and determine, in horsepower, the amount of power which the owner shall generate and in terms of cubic feet per second the amount of water which it is necessary to use in order to develop or generate such power.

(2) If the owner is dissatisfied with the construction so placed upon his rights, or with such limitation and definition, the Lieutenant-Governor in Council may, upon the application of the owner, direct a reference to ascertain what rights, if any, have been restricted or impaired by such limitation and definition, and if it is found that such rights exist, and that they are so restricted or impaired, to ascertain the compensation that should be paid to such owner for such restriction or impairment.

(3) The amount of the compensation awarded to the owner upon such reference shall be paid to him in the same manner as the amount of a judgment recovered against the Crown.

10.—(1) Where the Lieutenant-Governor in Council deems that the public interest requires that any rights heretofore conferred upon the owner of a water power should be restricted or limited in any particular, he may by Order-in-Council limit, define or restrict such rights to the construction, operation and use of such works only as may be deemed expedient in the public interest.

(2) If the owner deems himself aggrieved by any such limitation, definition or restriction, the Lieutenant-Governor in Council may direct a reference to determine what compensation, if any, should be paid to the owner, and the referee shall have the like powers and shall proceed in the same manner, and the amount awarded shall be payable in the same way as in the case of a reference under section 9.

Matters to be considered on reference.

11.—(1) Upon any reference under this Act, the referee shall take into consideration

- (a) The conditions under which any rights to generate or develop power were originally obtained;
- (b) The consideration paid or agreed to therefor;
- (c) The capital invested in any works by the owner of a water power;
- (d) The circumstances which render any limitation or restriction of such rights necessary and desirable in the public interest.

Powers of Commissioner

Rev. Stat. c. 18.

(2) The referee, upon any inquiry under this Act directed by the Lieutenant-Governor in Council, shall have all the powers which may be conferred upon a commissioner under *The Public Inquiries Act*.

Regulations by Lieutenant-Governor in Council.

12. The Lieutenant-Governor in Council may make regulations respecting

Rev. Stat. c. 18.

- (a) The procedure to be followed by the Inspector and for conferring upon him the powers of a commissioner under *The Public Inquiries Act*;
- (b) The form and term of notices to be given by the Inspector and the enforcement of his orders;
- (c) The appointment of officers, servants and agents by the Inspector and their duties and powers;
- (d) The procedure to be followed upon any appeal from an order of the Inspector;
- (e) Any returns to be made by the owner of a water power and the particulars to be stated in such returns;
- (f) The better carrying out of the provisions of this Act in general.

And the following Act was also passed by the Legislature of the Province of Ontario, during the Session of 1916, being "An Act to Amend *The Hydro-Electric Railway Act*, and to Confirm Certain By-laws and Contracts," as set out therein.

An Act to amend *The Hydro-Electric Railway Act* and to confirm certain By-laws and Contracts.

Assented to 27th April, 1916.

HIS MAJESTY, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This Act may be cited as *The Hydro-Electric Railway Act, 1916*. Short title.
2. Subsections 4 and 5 of section 4 of *The Hydro-Electric Railway Act, 1914*, are repealed and the following substituted therefor:—

⁴ Geo. V.,
c. 31, s. 4,
subs. 4, 5,
repealed.

 - (4) The agreement shall not be submitted to the electors nor shall any by-law for that purpose be proceeded with by the council of the corporation until the terms of the agreement have been submitted to and have received the sanction of the Lieutenant-Governor in Council.

By-law and
agreement
to be first
approved by
Lieutenant-
Governor
in Council.
 - (5) After such sanction shall have been obtained the council of the municipal corporation, or of each of the municipal corporations interested, may submit to the vote of the municipal electors authorized to vote on money by-laws, a by-law approving of the agreement and directing its execution, and if a majority of such electors vote in favour of the by-law, the council shall pass the same and the agreement shall be executed as directed by the by-law.

Submission
of by-law
 - (a) The by-law shall not be voted upon by the electors until at least three months have expired since the date of the sanctioning of the agreement by the Lieutenant-Governor in Council nor until the by-law and agreement have been published in the manner provided by *The Municipal Act* in the case of money by-laws, at least once a week for four successive weeks.

Rev. Stat.
c. 192.
3. Subsection 6 of section 4 of *The Hydro-Electric Railway Act, 1914*, as enacted by section 3 of *The Hydro-Electric Railway Act, 1915*, is repealed, and the following substituted therefore:—

⁴ Geo. V.,
c. 31, s. 4,
subs. 6,
amended.
⁵ Geo. V.,
c. 32.
6. The agreement may include in its terms the purchase or leasing or obtaining running rights over any steam railway, electrical railway, or street railway or any part thereof, as part of the line of railway to be constructed and operated by the Commission.

Acquiring
running
rights, etc.

Municipal corporation not to sell, etc., any railway without assent of electors.

4. Notwithstanding anything contained in any general or special Act heretofore passed by this Legislature, a municipal corporation shall not sell or otherwise dispose of any steam railway, electrical railway or street railway owned by it or of which it has acquired control by foreclosure or other proceedings or under the provisions of any special Act, unless and until a by-law authorizing such sale or other disposal has been submitted to and has received the assent of the municipal electors qualified to vote on money by-laws according to the provisions of *The Municipal Act*.

Rev. Stat. c. 192.

By-law approved.

5.—(1) The by-law, the form of which is set out in Schedule "A" to this Act, and which has been heretofore submitted to the vote of the municipal electors of the municipalities named in Schedule "B" to the said by-law is declared to have been so submitted in due compliance with the provisions of *The Hydro-Electric Railway Act, 1914*, and when finally passed by the council of any of the municipalities named in the contract appended to the by-law shall be legal, valid and binding upon the corporation and the ratepayers thereof, anything in any general or special Act of this Legislature to the contrary notwithstanding.

4 Geo. V., c. 31.

Council to pass by-law when assented to.

(2) It shall be the duty of the council of every municipality in which such by-law has been approved, or shall hereafter be approved by the electors, to finally pass the by-law and give effect to the same.

By-laws heretofore passed confirmed.

(3) The by-laws enumerated in Schedule "B" to this Act are confirmed and declared to be legal, valid and binding upon the respective corporations named in Schedule "B" and the ratepayers thereof, anything in any general or special Act relating to such corporation to the contrary notwithstanding.

Agreement confirmed.

6. Subject to the provisions hereinafter contained, the contract set out in Schedule "A" to this Act, and purporting to be made between the Hydro-Electric Power Commission of Ontario, of the first part, and certain municipal corporations shall be deemed to have been made in pursuance of *The Hydro-Electric Railway Act, 1914*, and to comply with the provisions thereof, and the said contract shall be legal, valid and binding upon the Commission and upon every municipal corporation a party thereto and executing the same, anything in the said Act or in any other general or special Act of this Legislature to the contrary notwithstanding.

Execution of agreement.

7. It shall be the duty of the head and the clerk or treasurer of each of the said municipal corporations to sign the said contract and affix the seal of the corporation thereto within three weeks after the passing of the by-law approving of the same, whether the same shall have been so submitted before or after the passing of this Act.

8. Notwithstanding anything in *The Municipal Act* contained, debentures issued or purporting to be issued by a municipal corporation under the authority of *The Hydro-Electric Railway Act, 1914*, for the purpose of carrying out any contract entered into with the Commission under the authority of the said Act shall not be included in ascertaining the limit of the borrowing powers of the Corporation as prescribed by *The Municipal Act*.

Debentures issued under 4 Geo. V., c. 31, not to be included in municipal debt for certain purposes.

9. Notwithstanding anything in this Act, or in *The Hydro-Electric Railway Act, 1914*, or the amendments thereto:—

4 Geo. V., c. 31, when work under contract may be proceeded with.

- (a) No bonds shall be issued for, nor shall any work be undertaken, or expense incurred upon the railways provided for in the contract mentioned in Section 6, until after the close of the present war; and
- (b) No such bonds shall be issued, or work undertaken, or expense incurred thereafter, except at such times and to such amount or extent, and within such periods as may be authorized from from time to time by the Lieutenant-Governor in Council;

but the Lieutenant-Governor in Council may, at any time after the passing of this Act, authorize the Commission to enter into agreements for the purchase of the right-of-way for any part of such railways, or for the procuring of options therefor.

SCHEDULE "A."

MUNICIPALITY OF THE

OF

BY-LAW No.

A. By-law to authorize a certain agreement made between The Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the _____ of _____, and other municipal corporations, for the construction, equipment and operation of an Electric Railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

Whereas it is expedient that the Corporation of the _____ of _____, and other municipal corporations should enter into an agreement under *The Hydro-Electric Railway Act, 1914*, and amendments thereto, with the Hydro-Electric Power Commission of Ontario, hereinafter called the Commission, for the construction, equipment and operation of an electric railway in and through the Municipality of the _____ of _____, and certain other municipalities, upon the terms and conditions and subject to the provisions set forth and contained in the agreement set out in this by-law, and according to the routes set forth in Schedule "A" to the said agreement;

And whereas the estimated cost of the work under the said agreement is \$13,734,155; and whereas the portion of the cost of the construction and equipment of the line to be borne by the Corporation of the Municipality of the _____ of _____ is estimated at \$ _____, as set out in Schedule "B" to the said agreement, subject to adjustments and apportionment between the Corporations by the Commission from time to time, as provided by the said agreement;

And whereas the total amount estimated to be required for the maintenance of the railway, apart from operating expenses, is \$214,583 (the operating revenue being estimated at \$1,692,175, and operation and maintenance at \$817,025);

And whereas the total annual amount estimated to be required, for the period of ten years immediately following the date of the issue of the bonds to be issued under the said agreement, for interest on the said bonds, is \$686,708; and thereafter, for the next ensuing forty years, the annual amount estimated to be required for sinking fund charges for the retirement of the said bonds is \$137,342, and for interest on the said bonds \$686,708;

And whereas the portion to be borne by the Municipality of the _____ of _____ of the said annual amounts estimated to be required for maintenance, sinking fund charges and interest is estimated at \$ _____ for the first ten years, as aforesaid, and thereafter at \$ _____ on the same basis as the portion of the cost of construction and equipment, as aforesaid, subject to adjustments and apportionment between the Corporations by the Commission from time to time as provided by the said agreement;

And whereas the amount of the whole rateable property of the Corporation according to the last revised assessment roll is \$ _____, and the amount of the debenture debt of the Corporation is \$ _____, of which neither principal nor interest is in arrear;

And whereas only a portion of the Municipality of the
of as enumerated in Schedule "C" to the said agreement, is
served by said railway;

Therefore the Municipal Council of the Corporation of the
of enacts as follows:—

1. It shall be lawful for the Corporation of the of ,
and the said Corporation is hereby authorized to enter into the following
agreement with the Hydro-Electric Power Commission of Ontario and other
corporations, the said agreement being hereby incorporated into and form-
ing a part of this by-law, and the and Clerk of the Corporation
are hereby authorized and directed to execute the said agreement upon
behalf of this Corporation and to attach the Seal of the Corporation thereto.

2. Only those duly qualified electors residing in the of ,
in the district enumerated in Schedule "C" of said agreement shall be
entitled to vote on the By-law, and any rate required to be levied for pay-
ment of debentures or interest thereon shall be raised, levied and collected
from the rateable property in such district only.

AGREEMENT HEREINBEFORE REFERRED TO.

This indenture made the day of in the year of our
Lord, one thousand nine hundred and

Between

The Hydro-Electric Power Commission of Ontario (hereinafter called
the "Commission") of the first part;

and

The Municipal Corporations of the Township of London, the Township
of Trafalgar, the Township of Waterloo, the Township of Blanshard,
the Township of Wilmot, the Township of Downie, the Township of
South Easthope, the Township of Toronto, the Township of Nassagawaya,
the Township of Guelph, the Township of Etobicoke, the Township of
North Easthope, the Township of Biddulph, the Township of Esquesing,
the Township of Puslinch, the Township of Eramosa, the Township of
Nelson, the Township of Ellice, the Township of East Zorra, the City
of Toronto, the City of London, the City of Berlin, the City of Guelph,
the City of Stratford, the Town of Waterloo, the Town of St. Mary's,
the Town of Milton, the Village of Mimico, the Village of New Toronto,
the Village of Port Credit, and the Village of New Hamburg (herein-
after called the "Corporations"), of the second part.

Whereas pursuant to the *Hydro-Electric Railway Act, 1914*, and amend-
ments thereto, the Commission was requested to enquire into, examine, in-
vestigate and report upon the cost of construction and operation of an
electric railway or railways to be constructed through certain districts in
which the Corporations are situated, together with the probable revenue
that would result from the operation of such railway or railways;

And whereas the Commission has furnished the Corporations with such a report showing (1) the total estimated cost, operating revenue and expenses of the railway or railways, and (2) the proportion of the capital cost to be borne by each of the Corporations as set forth in Schedule "B" attached hereto;

And whereas on receipt of the said report the Corporations requested the Commission to construct, equip and operate a system of electric railways (hereinafter called the railway) over the routes laid down in Schedule "A" attached hereto, upon the terms and conditions and in the manner herein set forth;

And whereas the Commission has agreed with the Corporations on behalf of the Corporations to construct, equip and operate the railway upon the terms and conditions and in the manner herein set forth; but upon the express conditions that the Commission shall not in any way be liable by reason of any error or omission in any estimates, plans or specifications for any financial or other obligation or loss whatsoever by virtue of this agreement or arising out of the performance of the terms thereof;

And whereas the electors of each of the Corporations have assented to by-laws authorizing the Corporations to enter into this agreement with the Commission for the construction, equipment and operation of the railway as laid down in the said schedules, subject to the following terms and conditions;

And whereas the Corporations have each issued debentures for the amounts set forth in Schedule "B" attached hereto, and have deposited the said debentures with the Commission;

Now, therefore, this indenture witnesseth:—

1. In consideration of the premises and of the agreements of the Corporations herein contained, and subject to the provisions of the said Act and amendments thereto, the Commission agrees with the Corporations respectively:—

(a) To construct, equip and operate the railway through the districts in which the Corporations are situate on behalf of the Corporations;

(b) To construct and operate the railway over the routes laid down in Schedule "A";

(c) To issue bonds, as provided in paragraph 3 of this agreement, to cover the cost of constructing and equipping the railway;

(d) To furnish as far as possible first-class modern and standard equipment for use on the railway, to operate this equipment so as to give the best service and accommodation possible, having regard to the district served, the type of construction and equipment adopted and all other equitable conditions, and to exercise all due skill and diligence so as to secure the most effective operation and service of the railway consistent with good management;

(e) To regulate and fix the fares and rates of toll to be collected by the railway for all classes of service;

(f) To utilize the routes and property of the railway for all purposes from which it is possible to obtain a profit;

(g) To combine the property and works of the railway and the power lines of the Commission where such combination is feasible and may prove economical to both the railway and the users of the power lines;

(h) To permit and obtain interchange of traffic with other railways wherever possible and profitable;

(i) To supply electrical power or energy for operation of the railway at rates consistent with those charged to municipal corporations;

(j) To apportion annually the capital costs and operating expenses of all works, apparatus and plant used by the railway in common with the Commission's transmission lines in a fair manner, having regard to the service furnished by the expenditure under consideration;

(k) To apply the revenue derived from operation of the railway and any other revenue derived from the undertaking to the payment of operating expenses (including electrical power), the cost of administration, and annual charges for interest and sinking fund on the money invested, and such other deductions as are herein provided for;

(l) To set aside from any revenue thereafter remaining an annual sum for the renewal of any works belonging in whole or in part to the undertaking;

(m) To pay over annually to the Corporations, if deemed advisable by the Commission in the interests of the undertaking, any surplus that may remain after providing for the items above mentioned. The division of such surplus between the Corporations to be fixed by the Commission on an equitable basis, having regard in the case of each Corporation to the capital invested, the service rendered, the comparative benefits derived, and all other like conditions;

(n) To take active steps for the purpose of constructing, equipping and operating the railway at the earliest possible date after the execution of this agreement by the Corporations and the deposit of the debentures as called for under clause 2 (b) hereof and to commence operation of each section as soon as possible after its completion;

(o) To make such extensions of the railway described in Schedule "A" as may appear advantageous and profitable from time to time.

2. In consideration of the premises and of the agreements herein set forth, each of the Corporations, for itself, and not one for the other, agrees with the Commission:

(a) To bear its share of the cost of constructing, equipping, operating, maintaining, repairing, renewing and insuring the railway and its property and works as established by the Commission, subject to adjustments and apportionment between the Corporations by the Commission from time to time;

(b) To issue debentures for the amounts set forth in Schedule "B" maturing in fifty years from the date of issue thereof, and payable yearly at the Bank, at Toronto, Ontario. Such debentures shall be deposited with the Commission previous to the issuing of the bonds mentioned above, and may be held or disposed of from time to time by the Commission, as provided for in clause 4 hereof, in such amounts, at such rates of discount or premium, and on such terms and conditions as the Commission in its sole discretion shall deem to be in the interests of the railway, the proceeds of such debentures being used solely for the purposes herein contained. The amount of debentures of each Corporation sold or disposed of from time to time shall be such proportion as may be fixed by the Commission of the total amount of debentures, due regard being given to the capital invested, the service rendered, the comparative revenue derived, and all other equitable conditions;

(c) To make no agreement or arrangement with, and to grant no bonus, license or other inducement to any other railway or transportation company without the written consent of the Commission;

(d) To keep, observe and perform the covenants, provisoes and conditions set forth in this agreement intended to be kept and observed and performed by the Corporations, and to execute such further or other documents and to pass such by-laws as may be requested by the Commission for the purpose of fully effectuating the objects and intent of this agreement;

(e) To furnish a free right of way for the railway and for the power lines of the Commission over any property of the Corporations upon being so requested by the Commission, and to execute such conveyance thereof or agreement with regard thereto as may be desired by the Commission.

3. It shall be lawful and the Commission is hereby authorized to create or cause to be created an issue of bonds, and to sell or dispose of the same on behalf of the Corporations. Such bonds to be charged upon and secured by the railway, and all the assets, rights, privileges, revenues, works, property and effects belonging thereto or held or used in connection with the railway constructed, acquired, operated and maintained by the Commission under this agreement, and to be for the total amounts mentioned in Schedule "B" hereto attached; provided that the Commission may, upon obtaining the consent as herein defined of the majority of the Corporations, increase the said bond issue by any amount necessary to cover the capital cost of extending the railway, and may also without such consent increase the said bond issue to cover the cost of additional works or equipment of any kind for use on the railway to an extent not exceeding ten per cent. (10%) of the bonds issued from time to time. In order to meet and pay such bonds and interest as the same becomes due and payable the Commission shall in each year after the expiration of ten years from the date of the issue of the bonds out of the revenue of the railway after payments of operating expenses (including electrical power) and the cost of administration set aside a sufficient sum to provide a sinking fund for the purpose of redeeming the same at maturity. Debentures issued by the Corporations in compliance with clause 2 (b) hereof, shall, to the extent of the par value of any bonds outstanding from time to time, be held or disposed of by the Commission in trust for the holders of such bonds as collateral security for payment thereof, it being understood and agreed that in the event of any increase of the said bond issue each Corporation shall, upon the request of the Commission, deposit with the Commission additional

debentures as described in clause 2 (b) hereof, to be held or disposed of by the Commission as collateral security for such increase of the said bond issue, and that any debentures held by the Commission in excess of the par value of the outstanding bonds from time to time may be held or disposed of by the Commission to secure payment of any deficit arising from the operation of the railway.

4. In the event of the revenue derived from the operation of the undertaking being insufficient in any year to meet the operating expenses (including electrical power), the cost of administration and the annual charges for interest and sinking fund on the bonds, and for the renewal of any works belonging in whole or in part to the railway, such deficit shall be paid to the Commission by the Corporations upon demand of and in the proportion adjusted by the Commission. In the event of the failure of any corporation to pay its share of such a deficit as adjusted by the Commission, it shall be lawful for the Commission in the manner provided in clause 2 (b) to dispose of debentures held by the Commission as security for any such deficit. Any arrears by any Corporation shall bear interest at the legal rate.

5. Should any Corporation fail to perform any of the obligations to the Commission under this agreement, the Commission may, in addition to all other remedies and without notice, discontinue the service of the railway to such Corporation in default until the said obligation has been fulfilled, and no such discontinuance of service shall relieve the Corporation in default from the performance of the covenants, provisoes and conditions herein contained.

6. In case the Commission shall at any time or times be prevented from operating the railway or any part thereof by strike, lockout, riot, fire, invasion, explosion, act of God, or the King's enemies, or any other cause reasonably beyond its control, then the Commission shall not be bound to operate the railway or such part thereof during such time; but the Corporations shall not be relieved from any liability or payment under this agreement, and as soon as the cause of such interruption is removed the Commission shall, without any delay, continue full operation of the railway, and each of the Corporations shall be prompt and diligent in doing everything in its power to remove and overcome any such cause or causes of interruption.

7. It shall be lawful for, and the Corporations hereby authorize the Commission to unite, the business of the railway with that of any other railway system operated in whole or in part by the Commission, and to exchange equipment and operators from one system to the other, proper provision being made so that each system shall pay its proportionate share of the cost of any equipment used in common.

8. If at any time any other municipal corporation applies to the Commission for an extension of the railway into its municipality, the Commission shall notify the applicant and the Corporations, in writing, of a time and place to hear all the representations that may be made as to the terms and conditions relating to such proposed extension. If, on the recommendation of the Commission, such extension shall be authorized, without discrimination in favour of the applicant, as to the cost incurred or to be incurred for or by reason of any such extension, the Commission may extend the railway upon such terms and conditions as may appear equitable to the Commission.

No such application for an extension of the railway into any municipality the Corporation of which is not a party to this agreement shall be granted if it is estimated by the Commission that the cost of service of the railway to the Corporations parties hereto will be thereby increased or the revenue and accommodation be injuriously affected without the written consent of the majority of the Corporations parties hereto.

9. The consent of any Corporation required under this agreement shall mean the consent of the council of such Corporations, such consent being in the form of a municipal by-law duly passed by the council of the Corporation.

10. The Commission shall, at least annually, adjust and apportion between the Corporations the cost of construction, equipment operation, interest, sinking fund, and also the cost of renewing the property of the railway.

11. Every railway and all the works, property and effects held and used in connection therewith, constructed, acquired, operated and maintained by the Commission under this agreement and the said Act shall be vested in the Commission on behalf of the Corporations; but the Commission shall be entitled to a lien upon the same for all money expended by the Commission under this agreement and not repaid.

12. Each of the Corporations covenants and agrees with the other:

(a) To carry out the agreements and provisions herein contained.

(b) To co-operate by all means in its power at all times with the Commission to create the most favourable conditions for the carrying out of the objects of the agreement and of the said Act, and to increase the revenue of the railway and ensure its success.

13. In the event of any difference between the Corporations, the Commission may, upon application, fix a time and place to hear all representations that may be made by the parties, and the Commission shall adjust such differences, and such adjustments shall be final. The Commission shall have all the powers that may be conferred upon a commissioner appointed under *The Act Respecting Enquiries Concerning Public Matters*.

14. This agreement shall continue and extend for a period of fifty years from the date hereof, and at the expiration thereof be subject to renewal, with the consent of the Corporations from time to time for like periods of fifty years, subject to adjustment and re-apportionment as herein provided for the purposes of this agreement as though the terms hereof had not expired. At the expiration of this agreement the Commission shall determine and adjust the rights of the Corporations, having regard to the amounts paid or assumed by them respectively under the terms of this agreement, and such other considerations as may appear equitable to the Commission and are approved by the Lieutenant-Governor in Council.

15. It is understood and agreed that the rates imposed for the share of the cost to be borne by those municipalities listed in Schedule "C" attached hereto, shall be imposed upon the rateable property set forth respectively in the said schedule.

16. This agreement shall not come into effect until it has been sanctioned by the Lieutenant-Governor in Council.

In witness whereof the Commission and the Corporations have respectively affixed their corporate seals and the hands of their proper officers.

SCHEDULE "A."

ROUTES:

Toronto Terminal-Humber River Section:

From the passenger terminal located near the foot of Yonge Street the line will run westerly to Sunnyside, using Harbour Board property and private right-of-way wherever possible; thence to the Humber River the line will parallel the G.T.R. as at present constructed.

Humber River-Port Credit Section:

From the west limits of the City of Toronto at the Humber River, the line runs westerly parallel to the G.T.R. main line. It crosses the Credit River at a point between the Lake Shore Road and the G.T.R.

Port Credit-Milton Section:

Leaving Port Credit the line crosses the G.T.R. about one mile west, running thence to a point north of Sheridan P.O., and from there directly to Milton.

Milton-Guelph Section:

Crossing the C.P.R. west of the C.P.R. station at Milton, location runs to Township of Esquesing, thence to Township of Nassagaweya, thence to Township of Puslinch, and thence in the general direction of the Eramosa River to Guelph.

Guelph-Berlin Section:

From Guelph the line continues to Berlin, leaving Guelph in a westerly direction and entering Berlin from the northeast. The location lies north of the present G.T.R. between Guelph and Berlin.

Berlin-Stratford Section:

From Berlin the line runs to the G.T.R. main line, which it parallels to a point near Baden, and thence south of the G.T.R. to a point east of Stratford, where it will cross the G.T.R. and enter the city.

Stratford-St. Mary's Section:

From Stratford the line runs in a westerly direction parallel to the old main line of the G.T.R. to a point north of St. Mary's.

St. Mary's-London Section:

The line runs in a south-westerly direction through St. Mary's and thence westerly, crossing the Canadian Pacific Railway at grade, and over the Thames River, running thence parallel to the old main line of the Grand Trunk Railway to a point near Granton; thence in a southerly direction through Biddulph Township to the northern boundary of London Township; thence in a southeasterly direction from concessions 14 to 10, inclusive, in London Township. From this point the line runs in a southerly direction through concessions 9 to 4, inclusive; thence following the Thames River through concessions 3 to 1, inclusive, in London Township, to a point

between the Sarnia road and the Thames River, a short distance west of the Warncliffe road, outside of the northwesterly boundary line of the City of London. Thence the roads runs in a southeasterly direction over private property and city streets, crossing over the Thames River in the City of London, to a point on Bathurst Street; thence easterly along Bathurst Street to the London & Port Stanley Railway, which at present terminates on Bathurst Street, immediately east of Richmond Street.

SCHEDULE "B."

Total amount of debentures to be issued by respective municipalities for deposit with the Commission under clause 2 (b).

Name of Municipal Corporation:

Township of London	\$630,389
Township of Trafalgar	578,921
Township of Waterloo	521,903
Township of Blanshard	402,909
Township of Wilmot	479,065
Township of Downie	418,735
Township of South Easthope	316,262
Township of Toronto	345,355
Township of Nassagaweya	343,147
Township of Guelph	361,025
Township of Etobicoke	401,335
Township of North Easthope	248,585
Township of Biddulph	142,166
Township of Esquesing	91,922
Township of Puslinch	70,300
Township of Eramosa	42,180
Township of Nelson	31,130
Township of Ellice	33,100
Township of East Zorra	39,000
City of Toronto	4,240,196
City of London	1,109,303
City of Berlin	774,040
City of Guelph	734,862
City of Stratford	651,735
Town of Waterloo	193,900
Town of St. Mary's	153,940
Town of Milton	65,000
Village of Mimico	111,200
Village of New Toronto	82,250
Village of Port Credit	54,050
Village of New Hamburg	66,250

Total amount of bonds to be issued, mentioned
in clause 3\$13,734,155

SCHEDULE "C."

Districts, rateable property of which shall bear rate levied against the Corporation:

Name of Municipal Corporation:

Made, passed and entered this day of 191 .

.....Reeve (Mayor).

.....Clerk.

SCHEDULE "B."

By-law No. , of the Municipal Corporation of the Township of London, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Township of London and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. , of the Municipal Corporation of the Township of Trafalgar, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Township of Trafalgar, and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. , of the Municipal Corporation of the Township of Wilmot, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Township of Wilmot and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. , of the Municipal Corporation of the Township of Downie, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Town-

ship of Downie and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the Township of Toronto, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Township of Toronto and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the Township of Nassagaweya, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Township of Nassagaweya and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the Township of Guelph, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Township of Guelph and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the Township of Etobicoke, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Township of Etobicoke and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the Township of Biddulph, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Township of Biddulph and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the Township of Esquesing, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Township of Esquesing and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the City of Toronto, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the City of Toronto and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the City of London, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the City of London and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the City of Berlin, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the City of Berlin and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the City of Guelph, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the City of Guelph and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the City of Stratford, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the City of Stratford and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the Town of Waterloo, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Town of Waterloo and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. _____, of the Municipal Corporation of the Town of St. Mary's, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Town of

St. Mary's and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. , of the Municipal Corporation of the Town of Milton, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Town of Milton and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. , of the Municipal Corporation of the Village of Mimico, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Village of Mimico and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. , of the Municipal Corporation of the Village of New Toronto, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Village of New Toronto and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. , of the Municipal Corporation of the Village of Port Credit, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Village of Port Credit and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

By-law No. , of the Municipal Corporation of the Village of New Hamburg, to authorize a certain agreement made between the Hydro-Electric Power Commission of Ontario and the Municipal Corporation of the Village of New Hamburg and other Municipal Corporations, for the construction, equipment and operation of an electric railway under *The Hydro-Electric Railway Act, 1914*, and amendments thereto.

Electric Power Company Agreement

An Act to confirm An Agreement between the Electric Power Company, Limited, and His Majesty the King, was passed at the previous Session of the Legislature.

An Act to confirm an Agreement between the Electric Power Company Limited, and His Majesty, the King.

Assented to 27th April, 1916.

WHEREAS the Electric Power Company is the owner of or con-^{Preamble.}
trolls the shares of the capital stock of the corporations named in the first recital of the agreement hereinafter mentioned; and whereas the said Electric Power Company, Limited, and the said Companies so controlled by it are the owners of or control, among other properties, assets, rights, contracts, licenses, privileges and franchises, a number of water powers and water privileges in the central portion of Ontario; and whereas it is desirable in the public interest that such water powers and privileges, and the development, transmission and distribution of electrical power or energy therefrom should be owned or controlled as public utilities; and whereas His Majesty, the King, represented therein by the Honourable George Howard Ferguson, Minister of Lands, Forests and Mines, has entered into a contract with the Electric Power Company, a copy of which is set out in Schedule "A" to this Act, providing for the purchase of all the assets and undertakings of every kind and nature whatsoever, of the Electric Power Company, Limited, and the said twenty-two companies mentioned in Schedule "A" to the said contract; and whereas it is expedient that the said contract should be confirmed, and the Government of Ontario should be empowered to complete the said purchase, and to deal with, manage and dispose of the property acquired under the said contract, or any part thereof;

Therefore His Majesty, by and with the advice and consent of the Legislative Assembly of the Province of Ontario, enacts as follows:—

1. This Act may be cited as *The Central Ontario Power Act, 1916.* ^{Short title.}

2. The agreement, dated the 10th day of March, 1916, between the ^{Agreement between} Electric Power Company, Limited, and His Majesty the King, repre-^{Crown and} sent therein by the Honourable George Howard Ferguson, Minister ^{Electric} of Lands, Forests and Mines, which agreement is set out in Schedule ^{Power Co.} "A" to this Act, is hereby confirmed and declared to be legal, valid and confirmed.
binding upon the parties thereto.

3. All and every part of the property, assets, rights, contracts, pri-^{Property} vileges, licenses, franchises, undertakings and businesses dealt with or ^{vested in} purporting to be dealt with, or agreed to be purchased or sold under the terms of the said contract set out in Schedule "A" are hereby vested in His Majesty the King, as representing the Province of Ontario, free from all liens, charges and encumbrances, save as provided in the said contract of purchase.

Crown.
authorized
to carry out
contract.

4. The Lieutenant-Governor in Council is hereby authorized and empowered to do all and every act, matter and thing requisite or necessary, or deemed advisable to be done in order to complete and carry out the said contract, and all and every proviso and stipulation therein contained purporting to be made by or on behalf of His Majesty the King.

Issue of
bonds for
purchase
money.

5.—(1) The Treasurer of Ontario is authorized to issue debentures of the Province of Ontario to the amount of \$8,350,000, payable at the office of the Treasurer of Ontario, Toronto, Canada, or the agency of the Bank of Montreal in the City of New York, United States of America, or at the agency of the said bank in the City of London, England, at the holder's option in debentures of \$1,000 each, bearing date the first day of March, 1916, and payable in gold coin on the first day of March, A.D. 1926, and with coupons to be attached for payment of interest at the rate of 4 per cent. per annum, payable in gold coin half-yearly at the office of the Treasurer of Ontario, Toronto, Canada, or at the agency of the Bank of Montreal in the City of New York, United States of America, or at the agency of the said bank in the City of London, England, at the option of the holder of the debentures, on the first day of March and the first day of September in each year until the principal falls due.

Registration
of
bonds.

(2) The Treasurer of Ontario is authorized at the request of the holders of the said debentures from time to time, or any of them, to have the same registered in the office of the Treasurer of Ontario.

Delivery of
bonds to
vendor
company.

(3) The said debentures, upon their issue, shall be delivered to the Electric Power Company, Limited, in full discharge of the purchase money agreed to be paid by the Crown under the contract of Purchase, Schedule "A" to this Act, and neither His Majesty, or the Treasurer of Ontario, or any member of the Government of Ontario shall be bound to see to the application of the said debentures or of the proceeds thereof.

Bonds
charged on
Consolidated
Revenue.

(4) The said debentures, and the interest thereon, shall be a charge upon, and shall be payable out of the Consolidated Revenue Fund of Ontario.

Order-in-
Council
vesting
property in
Commission,
etc.

6. The Lieutenant-Governor in Council may at any time, or from time to time by Order-in-Council vest in any commission, municipal corporation, municipal commission, company, corporation, firm or individual, the ownership or control, or power of administration and management of all or any of the undertakings, properties, rights, contracts, licenses, privileges, franchises and businesses of all or any of the twenty-two companies named in the first recital in the said agreement to such extent, and in such manner and for such purposes, for such periods and on such terms and conditions and for such estate as such Order-in-Council may provide, and thereupon such commission, municipal corporation, municipal commission, company, corporation, firm or individual shall be clothed with and have, hold, exercise, enforce and enjoy all the rights, powers and privileges in respect of such undertakings,

properties, rights, contracts, licenses, privileges, franchises and businesses as shall be granted by such order-in-council and, subject to any limitations or restriction in such order-in-council, shall have, hold exercise, enforce and enjoy in respect of such undertakings, properties, rights, contracts, licenses, privileges, franchises and businesses all the rights, powers and privileges which the company, whose undertakings, properties, rights, contracts, licenses, privileges, franchises and businesses is or are vested as aforesaid had therein before the passing of the Act.

7. Until the Lieutenant-Governor in Council shall in manner herein provided otherwise direct, the said undertakings, properties, rights, contracts, licenses, privileges, franchises and businesses, and every part thereof shall be under the management and control of some person nominated by the Lieutenant-Governor in Council who shall control, manage and administer the same for the benefit of His Majesty, either in the name of His Majesty, or in the name of the company now owning, controlling, or administering the same, and such person shall have, hold, exercise, enjoy and enforce all rights, powers and privileges in respect of the management, control or administration of the same as shall be granted or conferred by such order-in-council and, subject to any limitations and restrictions contained in such order-in-council, shall have, hold, enjoy, exercise and enforce all the rights, powers and privileges in respect of the property under his control, which such company or companies had before the passing of this Act.

8. A copy of this Act shall be deposited, copied and registered in the General Register of every Registry Office and Land Titles Office in which is registered or recorded the title to any lands affected by the terms of this Act, and every Registrar of Deeds, or Master of Titles as the case may be, shall, upon the request of the solicitors for the Crown, enter in the abstract index of each parcel or tract of land, the title to which is in any way affected by this Act, a note, entry or memorandum showing that the title thereto has been changed or affected by this Act, and referring to the date and registration number in the General Index where this Act has been recorded or registered as aforesaid.

SCHEDULE "A."

AGREEMENT made this tenth day of March, 1916,

Between:

THE ELECTRIC POWER COMPANY, LIMITED,

hereinafter called the vendor,

Of the first part,

and

HIS MAJESTY THE KING, herein represented by the Honourable George Howard Ferguson, Minister of Lands, Forests and Mines,

hereinafter called the purchaser,

Of the second part.

WHEREAS the vendor owns or controls the capital stock of the following companies carrying on business in the Province of Ontario, that is to say:

1. Auburn Power Company, Limited.
2. Central Ontario Power Company, Limited.
3. City Gas Company of Oshawa, Limited.
4. Cobourg Utilities Corporation, Limited.
5. Cobourg Water and Electric Company.
6. Cobourg Gas, Light and Water Company.
7. Eastern Power Company, Limited.
8. Light, Heat and Power Company of Lindsay.
9. Napanee Gas Company, Limited.
10. Napanee Water and Electric Company.
11. Nipissing Power Company, Limited.
12. Northumberland Pulp Company, Limited.
13. Oshawa Electric Light Company.
14. Otonabee Power Company, Limited.
15. North Bay Light, Heat and Power Company.
16. Peterborough Light and Power Company, Limited.
17. Peterborough Radial Railway Company.
18. Port Hope Electric Light and Power Company.
19. Seymour Power and Electric Company, Limited.
20. Sidney Electric Power Company, Limited.
21. Trenton Electric and Water Company, Limited.
22. Tweed Electric Light and Power Company, Limited.

And whereas the vendor has agreed to sell, and the purchaser has agreed to purchase, all the assets and undertakings of the said companies of every kind and nature, excepting such assets as are hereinafter specifically excepted, for the considerations hereinafter mentioned.

Now this agreement witnesseth as follows:

1. The vendor shall sell, and the purchaser shall purchase, as they existed on the first day of March, 1916, all the assets and undertakings of every kind and nature whatsoever of the vendor and of the said companies as follows:

1. All freehold and leasehold lands, tenements and hereditaments of the said company.

2. All plant, machinery, furniture, licenses, franchises, stock-in-trade, stores and all other chattels to which the said companies or any of them are or is entitled in connection with the businesses carried on by them respectively.

3. All pending contracts and engagements of the said companies or any of them in connection with any business so carried on.

4. All other property to which the said companies or any of them are or is entitled except, however, all cash and all bills and notes and all book and other debts due to the vendor or any of the said companies.

2. The consideration for the sale shall be the sum of Eight Million Three Hundred and Fifty Thousand dollars (\$8,350,000), which shall be paid and satisfied by the issue and delivery to the vendor of Ontario Government Debentures bearing date March 1st, 1916, and payable March 1st, 1926, and bearing interest at the rate of four per cent., payable half-yearly in Toronto, New York and London.

3. The assets and undertakings are sold free of all encumbrances, but as regards leaseholds subject to all the rents and covenants contained in any leases or agreements for leases under which the same are held, all of which are known to the purchaser. The vendor undertakes to pay and discharge all existing debts and liabilities of the said Companies.

4. The purchaser agrees to assume all contracts and engagements of the Vendor or any of the said Companies and to indemnify them against any claims in respect thereof, which arise hereafter.

5. The purchaser accepts the title of the vendor and the said Companies to all the said premises; it being understood that the purchaser shall obtain at his own expense the requisite consents for the assignments of any lease-holds.

6. From and after the first day of March, 1916, the vendor and the said Companies shall carry on the respective businesses and maintain the same as going concerns, but they shall from the said date be deemed to be carrying on such businesses on behalf of the purchaser, and shall account and be entitled to be indemnified accordingly, and all income and receipts shall be adjusted and divided as of the first day of March, 1916.

Should any difference arise as to said adjustments these shall be referred to G. T. Clarkson, Esquire, of Toronto, as an Expert and not as an arbitrator, and his decision shall be final and binding on the parties.

7. Taxes and rents and insurance shall be adjusted as of the first day of March, 1916.

The purchase shall be completed before the first day of May, 1916.

In Witness whereof the parties have executed this agreement the day and year above mentioned.

(Sgd.) THE ELECTRIC POWER COMPANY, LIMITED,
STRACHAN JOHNSTON,
President.

(Sgd.) SAMUEL D. FOWLER,
Asst. Sec'y.
(Seal of Co.)

(Sgd.) G. H. FERGUSON,
Minister Lands, Forests and Mines.

Witness: (Sgd.) C. C. HELE.

RIGHT-OF-WAY

High Tension Lines

The work of the staff during the early part of the year was devoted to completing the purchase of the right-of-way for the second High Tension Transmission Line from Niagara Falls to Dundas, and this work is practically completed.

Work was commenced in September on the purchase of lands necessary for the Chippawa-Queenston Development. Owing to the route of this work passing through lands in the Township of Stamford, which have been largely devoted to fruit growing and gardening, the holdings in the majority of cases being small and quite valuable, the work of acquiring these lands has necessarily been rather slow, but considerable progress has been made, and it is anticipated that the work will be completed before spring. In all it will be necessary to acquire about one hundred and twenty-five parcels of land owned by different parties for this right-of-way.

Plans have been completed and the work of purchasing the right-of-way commenced on the duplicate line from Dundas to Toronto. An additional purchasing agent, who will devote his time to this work during the coming winter, has been added to the staff, in order that delay in acquiring the needed lands in this case may be avoided.

The Commission now owns its own right-of-way through twenty-two townships and five urban municipalities, and in no case has it been necessary to resort to arbitration in order to acquire the lands desired. The Department has endeavoured to maintain a policy of uniform prices, and has met with comparatively little opposition from the owners of the lands sought to be purchased.

Low Tension Lines

On account of the large mileage of Low Tension Lines constructed during the past season, the whole time of one member of the staff, and at times of two, has been required to secure the necessary tree trimming and pole rights for this work.

CROSSINGS

The construction of high-tension and low-tension lines during the year has made it necessary to obtain the permission of various steam and electric railways, telegraph, telephone and power companies for crossings, to the extent of 300. In each case it was necessary to prepare applications and blue prints and forward the same to the different companies for approval and consent. Where consent is not given the matter is placed before the Board of Railway Commissioners for a ruling, all of which necessarily entails a considerable amount of work.

AGREEMENTS

During the fiscal year agreements for a supply of power have been made with the Cities of Sarnia and Kingston; the Towns of Dunnville and Forest; the Villages of Point Edward, Tara, Watford, Arthur, West Lorne, Milverton, Wyoming, Oil Springs, Rodney, Grand Valley and Omemee, and the Police Villages of Burgessville, Dashwood, Dublin, Highgate, Otterville, Springfield, St. Jacobs, Alton, and Zurich, and the Townships of York, Scarboro, Brant, Bentinck and Artemesia.

SECTION II

TRANSMISSION SYSTEM

STEEL TOWER TRANSMISSION LINES

Surveys

DUNDAS-TORONTO

During the early part of 1916, a great deal of reconnaissance work was done in the district between Dundas and Toronto, in order that the most suitable location possible might be found for a second steel tower line.

On June 10th, 1916, a survey party commenced work at Dundas, and made a very complete survey from there to the Humber river. This location survey was completed late in October, and the party is now engaged in taking levels for a profile of the entire line.

STATION EQUIPMENT AND BUILDING DEPARTMENT

GENERAL

Station Construction

During the year just closed the following stations which were referred to in the last report as having been authorized have been completed and placed in service: Linden, Listowel, Milverton, Harriston, Palmerston, Ridgetown, Blenheim, Petrolia, Exeter, Eugenia, Owen Sound, Chatsworth, Chesley, Durham, Dundalk, Mount Forest, South Falls, Huntsville.

The construction of stations was authorized during the year at Tavistock, Hanover, York, Etobicoke, West Lorne, Kilsyth, Orangeville, Port McNicoll (C.P.R.), Forest.

Changes for addition of transformers or switching equipment or both have been made, or authorized, for several of the transformer and distributing stations, these being necessitated by increase of load on the station in the majority of cases and by additional feeders being required in others. These alterations and additions are described later in this report.

The progress on design and construction of stations has not been as satisfactory as in past years, owing to conditions arising from war. At the time of writing, promises of delivery of equipment of six to eight months (where formerly two to three months were promised) are the rule. Furthermore, the high cost of materials and equipment is unprecedented. At the present time, contracts are placed for certain pieces of apparatus at double the prices that we were able to purchase same for two or three years ago.

Administration Building

The Administration Building described as being constructed in previous report was completed and the transfer of offices from the Continental Life Building was effected as conditions in the new building would permit, the executive offices moving in on April 1st.

It was thought that the Administration Building would provide sufficient quarters for several years. When the layout was prepared, each department was provided with at least three times the floor space which it had at that time in the Continental Life Building. However, the phenomenal growth of the Commission and the addition of the Central Ontario System has necessitated increasing the staff to such an extent that some of the departments are now utilizing all the space available.

A garage, with accommodation for three motor cars, was constructed on the property to the rear of the building to house motor cars for office use.

Toronto Storehouse Extension

The Stores Department, Laboratory and garage have all outgrown their quarters, and it was decided to proceed with the construction of an addition to the Toronto Storehouse and Laboratory. The extension is being made 132 feet deep, the full length of the present building. Reinforced concrete, flat slab construction, with brick curtain walls is being used. The extension will provide for a garage approximately 108 feet long by 66 feet wide, providing accommodation for about 24 motor cars. A machine and repair shop, the same dimensions as the garage, immediately over same, will be provided. The top story of this portion of the building will be used as a carpenter and paint shop. The interior portion of the building, 66 feet by 108 feet with basement and three floors, will be used exclusively for stores.

The entire basement, first and second floors of the present building will be remodelled and converted into laboratory accommodation.

Tenders were called for the construction of the building extension and the contract awarded to Messrs. Witchall & Sons, in the early fall. At the time of writing, excavation has been completed and the majority of the concrete footings have been poured.

Central Ontario System

When the Electric Power Company's interests were acquired, all drawings and designs available were transferred to this Department for use in connection with any extensions which might be decided upon.

Niagara Development

Several conferences were held with representatives of the electrical manufacturing companies with regard to the special features of the plant. Preliminary specifications for the main generators and transformers were issued to the different manufacturers and at the present time they are engaged in preparing designs which will enable them to more intelligently prepare tenders when our detailed specifications are issued. Conferences have also been held regarding special mechanical features of the generating station.

Public Utilities Commission of Peterboro

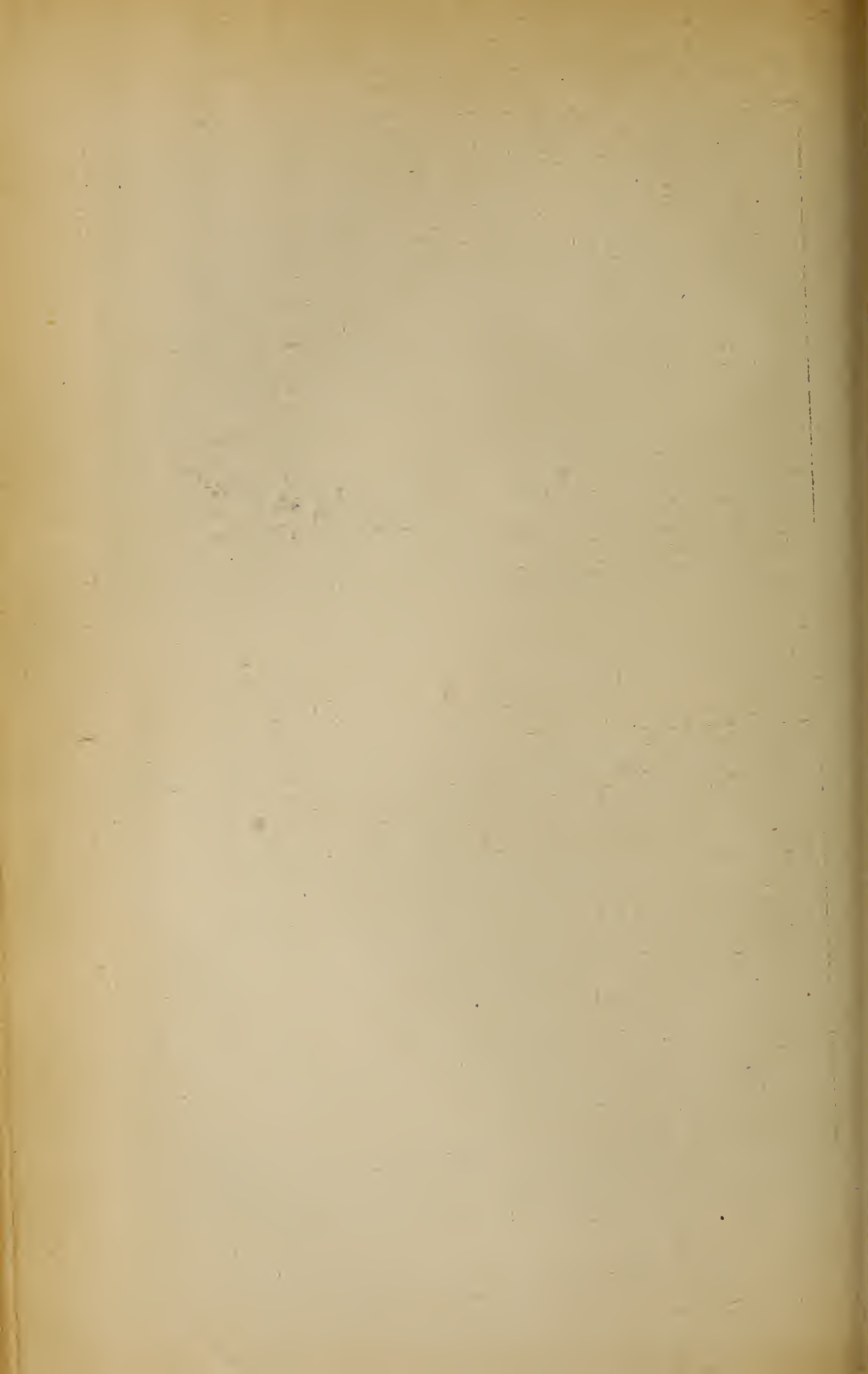
Preliminary designs were prepared for a proposed transformer station for the municipality. However, it was decided that this work be held up for the time being, at least.



Main Entrance Hall, Administration Building



Interior of Board Room, Administration Building



Cobden Municipal Generating Station

Plans and specifications were prepared for the electrical equipment for a generating station for the village of Cobden. The contract for the generator and exciter was placed with the Canadian General Electric Company, who also furnished the 3-k.w. station service transformer, and for the switchboard and connecting material with the Northern Electric Company.

The generator is rated at 100 kv-a., 2,300-volt, 3-phase, 60-cycle, 720 r.p.m., and is direct connected to a turbine. The belt-driven exciter is of 5-k.w. capacity at 125 volts.

The switchboard consists of one panel with automatic oil switch and full complement of meters, including one Westinghouse type "RO" watthour meter for measuring the output of the plant.

The contracts were awarded in May, and it is expected that equipment will be placed in operation in a short time.

NIAGARA SYSTEM

NIAGARA FALLS TRANSFORMER STATION

Building Extension

In order to provide improved facilities for handling equipment such as has been contracted for for this station, an extension to the erection room was authorized. This extension will also provide space for the equipment required for supplying 12,000 volt power to local municipalities and office space for different departments having duties in or around the station. This new addition will be approximately 30 feet wide by 84 feet long by 33 feet high. The work is being done by Messrs. Wells and Gray, the contracting firm which built the recent extension.

12,000 Volt Feeders

The two feeders, each composed of two 300,000 C.M. 3-conductor, lead-covered and steel-tape armored cables, referred to in the last report, were installed during the past summer. These connect our station with that of the Ontario Power Company. They will be utilized as spare feeders, and are designated No. 10 and No. 11.

For the purpose of receiving power from the Canadian Niagara Power Company a cable system consisting of eight 350,000 C.M. 3-conductor, lead-covered and steel-tape armored cables will be provided. This line will run on a private right of way from our station in a south-easterly direction to the brow of the hill overlooking the river near Falls View Station of the Michigan Central Railway, thence across this railway right of way and through the Queen Victoria Niagara Falls Park to a manhole at the south-western corner of the Generating Station of the Canadian Niagara Power Company. The cables for this system will be supplied and installed by the Standard Underground Cable Company. Two cables will comprise a feeder, and each feeder will be capable of delivering 12,500 horse power. The cables will be laid directly in the earth with creosoted plank above to prevent mechanical injury. Where cables cross highways they will be drawn into cast-iron soil pipe arranged with ventilators. It is expected to have at least one of these feeders in service early in December, 1916, installation work having already been started.

Additional Electrical Equipment

No. 7 bank of 110,000-volt transformers, consisting of three 3,500-kv-a. units, was installed and made ready for service in September. This equipment is similar to that installed for No. 5 bank and No. 6 bank, and was mentioned in previous report.

No. 3 bank of 45,700-volt transformers, consisting of three 3,500-kv-a. units, was contracted for with the Canadian General Electric Company. Two of these have been shipped, and work is progressing on the installation. The Canadian Westinghouse Company are supplying the switching equipment for this bank, and installation work is proceeding. This equipment is similar to that previously installed for banks No. 1 and No. 2.

Owing to additional capacity being required to meet the increasing loads, tenders were asked for and the Canadian Westinghouse Company were awarded the contract for three 7,500-kv-a. 12,000/63,500-volt transformers, forming No. 8 bank of transformers on the 110,000-volt bus, together with the necessary 12,000-volt and 110,000-volt switching equipment. These were the largest size units that could be placed in the space available in the building. When this bank is installed, the total capacity in this station in 110,000-volt transformers will be 96,000-kv-a. with one spare 3,500-kv-a. unit extra. It is expected that this No. 8 bank will be completed early in 1917.

Switching Equipment

In addition to the switching equipment above referred to as being supplied by the Canadian Westinghouse Company, this company will also supply the 12,000-volt and other equipment required for handling the four feeders from the Canadian Niagara Power Company, and the two spare armored cable feeders from the Ontario Power Company.

Bus and Switch Cell Structures

The contract for the construction of the necessary concrete cell work for the 12,000-volt oil switches and bus bars on above equipment was awarded to Messrs. Wells and Gray and this work is being proceeded with.

Water System

A contract was awarded to Messrs. Wells and Gray for the construction of a third sprinkling tank to take care of the increased amount of cooling water necessitated by the increase in the number of transformers in this station. The work on this tank has been started, and it is expected will be completed before the severe winter weather commences.

Additional pumping capacity was deemed advisable and an order was placed with the Storey Pump and Equipment Company for an additional (No. 5) pump, same to have capacity of 600 Imperial gallons per minute.

A 6-inch main running along Dixon St. to connect to the city water mains for emergency supply of water was installed by the Operating Department.

Protection of Service

Further studies are being made of possible methods of protecting and bettering the service. The incoming feeders from the Canadian Niagara Power Company

will be arranged so that at a later date we will be able to operate with two independent busses, that is, with duplicate feeder and transformer switches. The installation of power limiting reactors is also being investigated.

Niagara Falls Distributing Station

It was decided to designate equipment required for supplying 12,000-volt power locally as "Distributing Station," although it is housed in the same building with Transforming Equipment. It is desirable for accounting purposes to keep them separate.

Equipment, consisting of three 100-kv-a. Westinghouse transformers with oil switch and meters, was temporarily installed to supply the Niagara Falls water-works with 2,200-volt power for pumping purposes. Also work is under way on outgoing feeder equipment for supplying 12,000-volt power to the City of Niagara Falls, also to the Township of Stamford, by the date when their present contract expires. The permanent equipment for this service will be placed in the building extension referred to above.

Welland Municipal Station

Three Canadian Westinghouse Company's 150-kv-a., 13,200/2,300-volt, single-phase transformers were purchased from the St. Thomas Light, Heat and Power Commission. These transformers were received at Welland early in October. The switching equipment for these transformers was purchased and installed by the Welland Hydro-Electric Power Commission and the transformer bank was placed in service on October 30th.

Port Robinson Distributing Station

The Standard Steel Construction Company at Port Robinson have been receiving 12,000-volt power from the Commission at their sub-station, which contained three 60-kv-a., 13,200/220-volt single-phase transformers and switching equipment for two incoming 12,000-volt lines, for the above transformers and for the 220-volt feeders to their steel plant. This station and equipment was purchased by the Commission.

An additional bank of transformers and two 2,300-volt feeders have since been installed in this station. These transformers were purchased from the Dundas Hydro-Electric System, and consist of three 75-kv-a., 13,200/2,300-volt, 25-cycle, single-phase, self-cooled transformers. The new switching equipment was purchased from the Canadian General Electric Company. One feeder is used for feeding 2,300-volt, 3-phase power to the Standard Steel Construction Company and the other feeder for 2,300-volt, 3-phase local distribution service for the Welland Hydro-Electric Commission.

One of the 12,000-volt incoming lines has been disconnected from the station and arrangements have been made to tie these two lines together outside the station by means of a horn gap 3-pole disconnecting switch in each line.

This station was placed in service on October 13th.

Niagara-on-the-Lake Municipal Station

The corporation of the town of Niagara-on-the-Lake, built under the supervision of the Commission's construction men a new galvanized iron building for housing equipment necessary to enable them to receive power at 12,000 volts from

the Commission. This equipment was removed by the Commission's staff from the then existing power and pump house and erected in the new station, together with the connecting material and station entrances which had to be purchased. This station was placed in service about August 10th.

TORONTO TRANSFORMER STATION

Erection Room

The transformer erection room in this station is being enlarged to accommodate 5,000-kv-a. transformers, and a pit is being made in order to obtain necessary headroom. A new transformer truck is also being ordered.

Water Main

A 6-inch connection to the city of Toronto water main on Exhibition Road was made to the water system in this station in order to assure water supply for cooling the transformers during progress of work by the Toronto Harbor Commission, which is expected to interfere with the intake to the present pump house on the Lake Shore.

Drain

A connection is being made between the storm sewer on Strachan Avenue and the Toronto Hydro-Electric System's cable duct line manhole, which is a few feet north of the station. A tap will be taken off this connection and connected to the transformer water-cooling system and also to the storehouse.

No. 5 Transformer Bank

On December 16th, a contract was placed with the Canadian General Electric Company for three 5,000-kv-a., 63,500/13,200 volts, 25-cycle, oil-insulated, water-cooled, single-phase transformers, together with the 110,000-volt and 13,200-volt switching equipment for connecting this bank of transformers to the existing busses. The layout of the switching equipment is similar to that for the existing 2,500-kv-a. transformers, except that the 13,200-volt equipment was of heavier carrying capacity. These 5,000-kv-a. units were the largest that could be placed in the space available in the building and will be installed during the winter.

Changes to Transformer Banks No. 3 and No. 4

On August 15th a contract was placed with the Canadian General Electric Company for six 5,000-kv-a., 63,500/13,200-volt, 25-cycle, oil-insulated, water-cooled, single-phase transformers. Three of these are promised for shipment in August, 1917, and the other three in October, 1917. The contract will be placed within a short time for the necessary 13,200-volt switching equipment and connecting material to change or replace the existing equipment to control the additional transformer capacity. The above transformers will be used to replace the existing 2,500-kv-a. transformers on bank No. 3 and 4. This will make a total station capacity of 60,000-kv-a. with one 2,500-kv-a. spare unit extra.

LONDON TRANSFORMER STATION

London Utilities Commission

Office Building

At the request of the Public Utilities Commission, some assistance was given them in connection with an office building which is proposed.

Copies of specifications for different classes of work as used in connection with the construction of the Administration Buildings were given them.

Car Barn Sub-Station

Plans for a sub-station room in the London Railway Commission's car barns were prepared and submitted to the Public Utilities Commission. This room is 15 feet 6 inches by 17 feet 0 inches, and is designed to accommodate three 200-kv-a. single-phase, self-cooled 13,200/2,300-volt, 25-cycle, Moloney Electric Company's transformers, with necessary switching equipment and lightning arresters. All this electrical equipment was supplied and installed by the Utilities Commission.

Horton Street Station Railway Equipment

Engineering assistance was given to the Utilities Commission in connection with repairs on rotary converters and also in connection with the purchase of two 1,000-ampere S.P.D.T. and one 1,000-ampere S.P.S.T. 1,500-volt disconnecting switches for installing in the 1,500-volt D.C. feeders to provide a more flexible arrangement. These were purchased from the Canadian Westinghouse Company, and installed by the Utilities Commission at the end of July.

The Utilities Commission authorized the purchase from the Canadian General Electric Company of two 1,500-volt electrolytic arresters to be directly connected across the commutators of the 500-k.w., 1,500-volt rotary converters. The order for these was placed in September.

London Railway Commission

The car barns referred to in the last report were completed under the supervision of this Commission.

Exeter Distributing Station

The contractor, Mr. P. Bawden, finished the building early in December. The contract for the electrical equipment, consisting of three 100-kv-a., 13,200/2,300-volt, single-phase transformers, with switching equipment for same and for one 210-kv-a., 4,000-volt feeder was awarded to the Canadian General Electric Company. The installation was finished and the station was placed in service May 4th. In August an order was placed with the Canadian General Electric Company for one 13,200-volt electrolytic lightning arrester for this station. The order for an additional feeder panel and equipment controlling a 4,000-volt feeder to Hensall was awarded to the Canadian General Electric Company on July 5th, and will be installed this fall.

Lucan Distributing Station—Granton Feeder

The installation of a 4,000-volt feeder equipment in Lucan Distributing Station to supply the municipality of Granton was authorized, and a panel and equipment was taken from stock equipment previously ordered from the Canadian Westinghouse Company. This panel was installed and put into operation on July 27th.

GUELPH TRANSFORMER STATION

Board of Light and Heat Commissioners of Guelph

Engineering assistance was given to the Board of Light and Heat Commissioners of Guelph in connection with the purchase and testing of one 550-kv-a., 3-phase, 25-cycle, O.I.S.C., 13,200/2,300/575-volt transformer. Contract was placed with the Canadian General Electric Company, Limited, for this unit in March, and tests at the factory were witnessed and reported in August.

Prices were also obtained on 50-kv-a. and 100-kv-a., 3-phase automatic voltage regulators for the above Board.

Central Prison Farm Sub-Station

It was decided to replace the 13,200-volt condenser-type lightning arrester in this station by an electrolytic type of arrester and a Canadian Westinghouse 13,200-volt, 3-phase arrester was purchased. This will be installed and put into service by the Commission's maintenance department.

PRESTON TRANSFORMER STATION

1916 Extension

Plans and specifications have been prepared and tenders called for the construction of a 33 feet by 56 feet extension to the north end of the present building for the accommodation of an additional bank of three 750-kv-a., 63,500/13,200-volt transformers with necessary switching equipment, this additional bank of transformers to be comprised of the former spare unit and two 750-kv-a. units to be transferred from Stratford Transformer Station.

The secondary voltage of this station will be changed from the present 6,600 volts to 13,200 volts, and all oil switches will be made electrically operated requiring a rearrangement of apparatus, plans for which are now being prepared. This change will necessitate changing the voltage of all stations fed from this station, including Preston, Hespeler, Galt and Breslau Stations, and the Galt, Preston & Hespeler Railway feeder to 13,200 volts, for which the necessary changes are now being considered.

Galt Waterworks Commission

In order to provide a more flexible arrangement and to obtain greater power factor corrective capacity from the motors, it was decided by the Galt Waterworks Commission to divide the motor-driven pumping unit in the waterworks station into two separate units, by adding another 250-kv-a. synchronous motor and connecting it to the south 800-gallon pump, leaving the 250-kv-a. motor first supplied on the north pump. Accordingly the Hydro-Electric Power Commission of Ontario were requested to prepare specifications and obtain tenders on the new motor and switching equipment required.

Tenders were obtained and submitted to the Waterworks Commission and the contract for one 250-kv-a., 3-phase, 25-cycle, 750 r.p.m. synchronous motor with exciter and control panel and necessary wiring material was placed with the Canadian Westinghouse Company, Limited, in February.

The manufacture of this equipment was followed up in the factory by frequent inspections and witness tests were made when the motor was completed. This motor and other equipment was placed in operation in October.

KITCHENER TRANSFORMER STATION

No work was done in this station during the year by this Department. The erection of the sheet steel storehouse mentioned in last report was completed.

Baden Distributing Station Extension

Transformers

It has been arranged to increase the transformer capacity of this station by removing the present bank of 75-kv-a. transformers and replacing them by a bank of 150-kv-a. capacity, purchased from the municipality of Seaforth.

Wellesley Feeder

An additional 4,000-volt feeder equipment, to supply the village of Wellesley, has been bought from Canadian Westinghouse Company and installed in this station by the construction staff of the S. E. & B. Department. In service on October 23rd.

STRATFORD TRANSFORMER STATION

Plans are under consideration for the removal of the 750-kv-a. transformers in this station to Preston Transformer Station and for a rearrangement of the outgoing feeders, making all feeders out of this station operate at 26,400 volts. This will involve changes to the municipal stations at Stratford, Seaforth and Mitchell, which are noted below.

Stratford Municipal Station

Owing to arrangements which have been made to supply power at 26,400 volts instead of 13,200 volts to the Stratford Utilities Commission, it was decided to construct a new sub-station.

At the request of the Utilities Commission, specifications and drawings have been prepared by the Commission covering a new two-storey building with basement to form an extension measuring 53 feet 9 inches by 29 feet 5 inches by 42 feet 9 inches high, to their existing station. This new building will accommodate four 750-kv-a., 26,400/2,300-volt, 3-phase, 25-cycle O.I.W.C. transformers, together with switching equipment for same and for two incoming 26,400-volt, 3-phase lines and the low-tension circuits.

The 26,400-volt switching equipment will be located on the second floor, the transformers and low-tension switching equipment, street lighting transformers, etc., on the main floor, while the potential regulator, water pumps, etc., will be located in the basement.

Drawings and specifications have also been made up and tenders requested for the switching equipment to control the two incoming lines, three 750-kv-a., 3-phase transformers, three 2,300-volt commercial lighting feeders, one 100-kv-a. potential regulator, one street lighting bus and one station service bank of transformers with 110 and 220-volt station feeders. The present four power and lighting feeder panels together with the eight constant current street lighting transformers and their panels will be moved to the new station. The present 110-k.w., 2,200-volt, 3-phase synchronous motor which is now driving a 220-volt D.C. generator will be moved to the basement of the new station, and the control panel will be placed in the main switch-board on the main floor. This motor will then be used for power factor correction.

Seaforth Municipal Station

This station which is now operating at 13,200 volts high tension with three 150-kv-a., 13,200/2,200-volt, single-phase Canadian Crocker Wheeler Company's transformers will be rearranged to be fed from two 26,400-volt lines tied together through horn gap disconnecting switch outside the station. Three 150-kv-a. 26,400/2,300-volt transformers have been purchased from the Canadian General Electric Company and should be ready for shipment in November. The necessary switching equipment required on account of the change to 26,400 volts has been ordered.

As soon as the existing 13,200-volt transformers are released, they will be transferred to the Baden Distributing Station, and the remaining 13,200-volt equipment will be used elsewhere on the System.

Mitchell Municipal Station

Owing to the arrangements to transmit power to Mitchell at 26,400 volts instead of 13,200 volts, three 75-kv-a., 26,400/575-volt, single-phase transformers have been purchased from the Canadian General Electric Company, and the switching equipment required has been purchased. At present the 13,200-volt equipment is located in a building, part of which is used for other purposes. The corporation of Mitchell are considering the advisability of building a new and separate brick station for housing the 26,400-volt equipment and transformers.

As soon as the new 26,400-volt equipment and transformers are installed and placed in service, the existing 13,200-volt equipment and transformers will be removed for use elsewhere on the System.

Tavistock Distributing Station

For the purpose of distributing power to Tavistock, a standard type "H" station layout equipment is being installed in a part of the existing pump house at Tavistock. On August 30th three 75-kv-a., 26,400/2,300-volt, single-phase, Canadian Crocker Wheeler Company's transformers were purchased for this station and are due for shipment in November. The 2,300-volt feeder panel, the 26,400-volt fuses and the insulators and connecting materials were supplied by the Canadian Westinghouse Company. Standard outdoor horn gap switch and a choke coil made up in the Commission's machine shop are being installed on the incoming line.

In order to give service from the station as soon as possible it was arranged to transmit power to same at 13,200 volts temporarily and install therein three 25-kv-a. 13,200/2,300-volt, single-phase Canadian Moloney Electric transformers which were in stock. This work is now under construction, and it is expected that the station will be placed in service at 13,200 volts early in November.

Listowel Distributing Station

The equipment for this station, as listed in last year's report, was furnished by the Canadian Westinghouse Company. A 26,400-volt ungrounded neutral aluminum cell lightning arrester was ordered from the Canadian General Electric Company. The Canadian Westinghouse Company were notified May 5th, to make shipment of the 100-kv-a. transformers and switching equipment, and same was installed and power furnished on May 27th. The lightning arrester referred to above was installed and put into service June 3rd.

Milverton Distributing Station

The type "H" building referred to in last annual report was completed in the early part of January. The contract for the three 75-kv-a., 26,400/4,000-volt transformers and switching equipment as mentioned in last report was awarded to the Canadian General Electric Company in January. The work of installation was completed about the middle of May. The station was placed in service on May 22nd.

Harriston Distributing Station

The contract for the type "H" station building referred to in last year's report was awarded to Mr. W. N. Hutchison in November, and the building was completed first week of January. The contract for the three 75-kv-a., 26,400/4,000-volt transformers and switching equipment was awarded to the Canadian General Electric Company. The installation of this equipment was finished about the middle of June, and the apparatus tested out and put into service June 30th.

This station also accommodates the 12-k.w. constant current street lighting transformer and panel belonging to the municipality, which equipment was transferred from the old station to the new distributing station by the Commission's construction staff.

Palmerston Distributing Station

The type "H" building referred to in last year's report was finished the latter part of January. Contract for the three 75-kv-a., 26,400/4,000-volt transformers and switching equipment was awarded to the Canadian General Electric Company, and installation was completed the latter part of May. The station was tested out and placed in service on June 6th.

There is also installed in this station a 12-k.w. constant current transformer and panel, the property of the municipality.

Municipality of Palmerston

At the request of the municipality tenders were obtained on a street lighting transformer and panel for same. The orders were placed in February with the Canadian General Electric Company for the panel, and with A. H. Winter Joyner, Limited, for one 12-k.w., 6.6-ampere, 2,300-volt Adams Bagnall constant current transformer. The equipment was installed by the Commission's construction staff.

ST. MARY'S TRANSFORMER STATION

The corrugated sheet steel shed referred to in last report was completed. No other work was done at this station.

St. Mary's Portland Cement Company Distributing Station Extension

Owing to the increased load at this station it was considered advisable to increase the transformer capacity and it was decided to have three 150-kv-a., 13,200/550-volt Packard Electric Company's transformers now in use in the Stratford Municipal Station transferred to this station, when released from Stratford.

Plans were prepared showing necessary changes in the original arrangement, and additions for this second transformer bank and the necessary additional

apparatus was ordered from the Canadian Westinghouse Company, and will be installed by the Commission's Construction Department.

The 550-volt leads from this second bank of transformers will run to a new feeder panel to be supplied by the St. Mary's Portland Cement Company.

WOODSTOCK TRANSFORMER STATION

The corrugated sheet steel shed referred to in last report was completed. Plans are being considered for extending this station to accommodate equipment for a second 110,000-volt line.

ST. THOMAS TRANSFORMER STATION

No. 2 Bank of Transformers

A contract was placed with the Canadian Westinghouse Company in April for the 110,000-volt and 13,200-volt switching and metering equipment for the second bank of three 750-kv-a., 63,500/13,200-volt transformers. This second bank comprises two transformers from Guelph Transformer Station, which were delivered and installed in this station by the Maintenance Department in March, and the original spare transformer in this station.

The installation work was completed by the Commission's Construction Department and the second bank was placed in service July 30th.

Additional Feeder Equipment

A contract was placed with the Canadian Westinghouse Company, April 6th for complete switching and metering equipment for two additional 13,200-volt feeders, including lightning arresters. One of these feeders will be in the old station and one in the new extension. The switchboard panel in the old station will line up as far as possible with the present Canadian General Electric switchboard. The installation work will be done by the Commission's Construction Department when material is received.

Railway Supply Equipment

Considerable time has been spent in obtaining data and studying the operation of 1,500-volt D.C. rotary converters on railway work, and this is being continued.

In order to better sectionalize the feeder system, three 1,000-ampere S.P.D.T. and one 1,000-ampere S.P.S.T. 1,500-volt disconnecting switches were purchased from the Canadian Westinghouse Company, Limited, and installed in 1,500-volt feeders. This work was completed early in August.

Two electrolytic lightning arresters were purchased in August from the Canadian General Electric Company, and it is the intention to connect these directly across the commutators of the two 500-kw. rotary converters in this station to give increased protection to the windings.

St. Thomas Municipal Station

Building

At the request of the St. Thomas Hydro-Electric Commission, plans and specifications were prepared for the construction of a combined office and sub-station. Tenders were called for and submitted to the local Commission, who awarded the contract to Mr. A. E. Ponsford, of St. Thomas, in February.

The building, which is 40 feet by 80 feet, is located on the south-west corner of St. Catharine and Gas Streets. It is built of red pressed brick with buff-colored Indiana limestone trim. Steel window sash, reinforced concrete floors, and steel beam construction were used throughout, making an entirely fireproof building. The front part of the building is partitioned off for offices on all floors, the space occupied being 37 feet wide by 20 feet 1 inch deep inside. The building will be completed early in December.

Electrical Equipment

The electrical equipment is located at the rear of the offices, occupying a space of approximately 37 feet by 55 feet 6 inches on each floor. The 13,200-volt apparatus is located on the second floor, the main transformers, constant current transformers, rotary convertor and switchboard on the main floor, and the cables and service transformers in the basement, which will also be used for storage purposes.

The station is fed by two 13,200-volt incoming lines and has one 13,200-volt outgoing feeder with provision for a second outgoing feeder, all these being equipped with Canadian Westinghouse electrolytic lightning arresters. These feeders are connected through choke coils, disconnecting switches and oil switches to a sectionalized bus, and from this bus leads are taken through oil-switches to three 100-kv-a. 13,200/375-volt, single-phase Canadian Westinghouse transformers and two new 750-kv-a., 13,200/2,300-volt, three-phase, Canadian General Electric transformers. Provision was also made for a future three-phase transformer. From the 100-kv-a. transformers the 375-volt leads are taken in conduit to a 200-k.w., 600-volt D.C. rotary convertor, which feeds the local street railway circuit.

From the 750-kv-a. transformer, leads are carried in conduit to the 2,300-volt busses back to the main switchboard on the main floor from which the following feeders are taken out in conduits underground, three commercial lighting, one 2,300-volt power, two 550-volt power feeders and five series street lighting feeders with provision for several future feeders. The 550-volt power is obtained from three 30-kv-a., 2,300/550-volt, single-phase Packard Electric Company's transformers installed in the basement. Three 28-k w. Adams Bagnall, and two 22-k w. Canadian Westinghouse constant current transformers are used for the series lighting feeders. The main 2,300-volt busses are sectionalized to allow for the future installation of a regulator if found necessary.

Three 25-kv-a., 2,300/220/110-volt transformers located in the basement and connected to the 2,300-volt busses through expulsion fuses supply light, heat and power for the station and office.

As much as possible of the electrical equipment from the old station was used in the new station, but in addition to the new 750-kv-a. transformers and the 25-kv-a. service transformers mentioned above, it was found necessary to purchase a number of new switchboard panels, meters and relays from the Canadian Westinghouse Company.

The equipment in the new station is being installed by the Commission's construction staff in conjunction with the local Commission's staff in such a way that no serious interruption of service is necessary. One 750-kv-a. transformer was installed in the old station and put in service temporarily on September 20th, releasing one old bank of three 150-kv-a. single-phase transformers which were disposed of to the Welland Hydro-Electric Commission for use in the Welland Municipal Station. It is expected that the installation will be entirely completed

early next year, the progress not being as rapid as expected, owing to slow deliveries of material and the necessity for maintaining service during the transfer to the new building.

West Lorne Distributing Station

A type "E-2" station was authorized for West Lorne to supply power to West Lorne and to Rodney. The contract was awarded for the building to Messrs. Horton Bros., of St. Thomas, on October 14th. This station is to contain three 75-kv-a., 13,200/2,300-volt transformers with two outgoing 4,000-volt feeders, each of 100-kv-a. capacity, one to supply West Lorne and the other Rodney. The contract for the electrical apparatus was given to the Canadian Westinghouse Company. It is expected that this station will be placed in operation before January 1st, 1917.

COOKSVILLE TRANSFORMER STATION

The corrugated sheet steel shed referred to in previous report was erected. Plans are being considered extending this station to accommodate equipment for a second 110,000-volt line.

Mimico Distributing Station

Owing to increasing demand for power, it was found necessary to put in additional transformer capacity in the Mimico Distributing Station. As the plans under consideration for this district contemplated the erection of a new larger station, it was decided to install the additional transformers required in a temporary extension to the existing building.

Three 300-kv-a., 13,200/2,300-volt, 25-cycle, single-phase transformers of Johnson and Phillips make were purchased from Chapman and Walker (in liquidation) for this station, but, owing to the necessity for overhauling them, they could not be made ready for service in time, and arrangements were finally made to purchase from the corporation of Brampton three 150-kv-a., 13,200/2,200-volt Crocker Wheeler Company's transformers. The temporary building extension was erected and the 150-kv-a. transformers installed and the necessary wiring changes made by the Commission's construction staff. These additional transformers were placed in service on October 15th.

Etobicoke Distributing Station

This station will be constructed in New Toronto village and will be used for supplying power to Mimico, New Toronto and the Provincial Institutions in the neighborhood. Tenders have been called for the supply of two 1,500-kv-a., 3-phase transformers for this station. This station will be supplied from Cooksville Transformer Station at 13,200 volts, but is so designed that it can later be fed from the proposed York Transformer Station at 26,400 volts.

In a former report "Etobicoke Distributing Station" was mentioned. This, however, referred to a proposed station in the vicinity of Mimico Asylum, which was never constructed, and the switching equipment ordered for same was used elsewhere, partly at Port Robinson Distributing Station and partly at Paris Municipal Station (McFarlane Engineering Company).

Pending construction of the above new station, a temporary station will be erected to take care of the immediate requirements for a supply of power to Brown's Copper and Brass Rolling Mills at New Toronto. It is proposed to use here the three 300-kv-a. Johnson and Phillips transformers referred to above under Mimico Distributing Station.

Brampton Municipal Station

At the request of the corporation of Brampton, tenders on three 300-kv-a., 13,200/2,300/575-volt transformers were obtained and submitted to the Brampton Commission. The contract for these was awarded to the Moloney Electric Company of Canada. Witness tests on these were made at the manufacturer's factory and the results reported to Brampton. These transformers were installed in the latter part of August.

The 150-kv-a. transformers which were replaced by the 300-kv-a. units, were purchased by the Commission for use at Mimico Distributing Station.

Corporation of Weston

The Commission have purchased for the Weston Hydro-Electric Commission three 150-kv-a. transformers 13,200/2,200/550-volt from the Stratford Utilities Commission to take care of the load of Canada Cycle and Motor Works at Weston.

The transformers will be installed in the company's own building by the Commission's construction staff.

The Commission will also take care of the necessary changes in the Weston Municipal Station to take care of this additional load. This will consist of the purchase and installation of one 13,200-volt oil-switch with panel and necessary metering equipment. It is expected that this equipment will be ready in December.

BRANT TRANSFORMER STATION

No work was undertaken in the Brant Transformer Station during the year, but plans are being considered for extending this station to accommodate equipment for a second 110,000-volt line.

Paris Municipal Station (McFarlane Engineering Company)

With authority from the corporation of the town of Paris, the Commission purchased electrical equipment for a second municipal sub-station to be installed in a brick building, the property of the McFarlane Engineering Company for the purpose of supplying this company with power. The equipment consists of three 150-kv-a., 26,400/2,300-volt Moloney Electric Company's transformers, protected by expulsion type fuses, choke coils and air-break switch.

One 2,300-volt, 3-phase feeder panel purchased from Canadian General Electric Company is erected equipped with metering apparatus and oil switch for controlling the power to the company's factory.

The equipment is being installed by the Commission's construction staff. This station will be completed ready for service in November.

KENT TRANSFORMER STATION

No work was undertaken in this station during the year.

Ridgetown Distributing Station

The building referred to in last annual report was completed early in November and the electrical equipment installed and placed in service November 24th.

Blenheim Distributing Station

The installation of the 22-k.w. constant current transformer and panel for same mentioned in the last report was completed and this equipment was placed in service in December.

Petrolia Distributing Station

The building for this station was completed in December. The contract for the electrical equipment was awarded to the Canadian General Electric Company and included two 4,000-volt feeder panels and two street lighting feeder panels for the local Commission. The contract also included one 4,000-volt feeder panel for supplying the municipality of Wyoming.

The two 16-kw. constant current transformers purchased previously by the Commission for the municipality were installed, and the entire station, excepting the Wyoming feeder, was placed in service on April 25th. The Wyoming feeder was completed later and placed in service October 4th.

Forest Distributing Station

The corporation of Forest decided to take power from the Commission instead of generating same by steam. It was arranged to use a part of their present building to house the necessary electrical material.

On September 5th a contract was placed with the Canadian Westinghouse Company for a standard type "H" station equipment which will be installed by them and which will consist of three 75-kv-a., 26,400/2,300-volt, single-phase transformers together with the switching equipment and connecting material for one incoming 26,400-volt line and one 2,300-volt feeder. The Westinghouse equipment is due for shipment early in December.

Sarnia Municipal Station

It has been arranged to supply the corporation of Sarnia with power over two 26,400-volt, 3-phase lines from the Kent Transformer Station. This equipment will consist of three 750-kv-a., 3-phase, 26,400/4,000-volt water-cooled transformers, with provision for one future transformer, four 28-k.w., 6.6-ampere constant current street lighting transformers, three 25-kv-a. station service transformers and one 75-kv-a., 4,000-volt feeder potential regulator, together with switching equipment for two incoming 26,400-volt lines, three 4,000-volt commercial lighting feeders, four 4,000-volt power feeders, one 4,000-volt feeder to railway bus, and one 4,000-volt feeder to the constant current transformer bus. The contract for the three 750-kv-a. transformers was placed with the Canadian General Electric Company on May 9th.

Five of the existing switchboard panels will be used in the new switchboard. All the remaining switching equipment, together with the 75-kv-a. potential regulator and the service transformers were purchased from the Canadian General Electric Company on August 14th, and are due for shipment on December 29th, 1916, excepting the 26,400-volt oil switches, which are due on March 14th, 1917.

The 28-k.w. street lighting transformers were purchased from A. H. Winter Joyner, Toronto, on May 23rd. One of these transformers was shipped to the Commission's Testing Laboratory for special tests.

Arrangements are being made to transfer a 26,400-volt oil switch from the Commission's Essex Station and to have the Canadian General Electric Company

ship some 26,400-volt disconnecting switches in order to make temporary connections to place two of the 750-kv-a. transformers in service early in November.

This equipment will be installed by the Hydro-Electric Power Commission's Construction Department, in the existing steam generating station formerly owned by the Sarnia Gas and Electric Company. Power to this station will be metered at the incoming 26,400-volt lines.

On September 7th, a contract was placed with the Canadian General Electric Company to supply and install one 410-kv-a., 4,000-volt, 3-phase, 25-cycle synchronous motor and base to replace an existing 450-h.p., 23,000-volt, 3-phase, 60-cycle induction motor which is direct connected to a 300 kw. D.C. 600-volt railway generator. This motor is due for shipment on February 21st, 1917.

ESSEX TRANSFORMER STATION

In order to provide temporary switching equipment at Sarnia Municipal Station, one spare 26,400-volt oil switch with current transformers was removed from Essex Transformer Station and shipped to Sarnia. This will be returned to Essex Station and re-installed at a later date.

Walkerville Municipal Sub-Station

Engineering assistance was given to Walkerville Hydro-Electric System in connection with transformer repairs, also in connection with preparation of plans and specifications for the switching equipment required for controlling one 400-kv-a. 3-phase, O.I.W.C., 25-cycle, 26,400/2,300-volt transformer of Moloney Electric Company's manufacture, to supply the 400-kv-a. 2,300-volt feeder to the Canadian Bridge Company.

YORK TRANSFORMER STATION

It was decided to construct a transformer and interswitching station near the western limits of the City of Toronto, same to be used as a transformer station to relieve Toronto Transformer Station; and to supply power in New Toronto and the vicinity, and for interswitching between the two present and two new lines from Dundas and the two present lines into Toronto. It is the intention to ultimately deliver power from this station at 26,400 volts, but for the present it is intended to install the two banks of 2,500-kv-a. transformers now in Toronto Station, but which will be replaced next summer by 5,000-kv-a. units and operate at 13,200 volts.

WASDELL'S FALLS SYSTEM

WASDELL'S FALLS GENERATING STATION

It was decided to use one of the two 22,000-volt lines out of the Wasdell's Falls Generating Station as a tie line to the Severn System, and as a feeder to the Corporation of Orillia Station and to install the necessary metering equipment to measure the power supplied over this line.

Plans were prepared showing the necessary changes in the original arrangement. The material was ordered by the Operating Department. The necessary changes, except the metering equipment, were completed on July 23rd, 1916, and the metering equipment will be completed when the new meters arrive at the station, all the installation work being done by the Operating Department.

Beaverton Distributing Station

There will be installed in the Beaverton Distributing Station the Canadian Westinghouse 22,000-volt, low equivalent lightning arrester, which will be moved from Cannington Distributing Station.

Cannington Distributing Station

An order was placed with the Canadian General Electric Company for one 22,000-volt electrolytic lightning arrester, to be installed in the Cannington Distributing Station. This arrester will replace the Canadian Westinghouse low equivalent 22,000-volt arrester now installed in this station and which will then be moved to Beaverton Distributing Station.

SEVERN SYSTEM

BIG CHUTE POWER HOUSE

In December estimates were prepared covering additional electrical equipment and superstructure for contemplated increased generator capacity.

Collingwood Distributing Station

Owing to the increase of the load at this station, it was found necessary to increase the transformer capacity, and on December 22nd, the contract was awarded to the Canadian General Electric Company for three 400-kv-a. 22,000/2,300-volt 60-cycle, single-phase transformers to replace the three 250-kv-a. Canadian General Electric transformers originally installed.

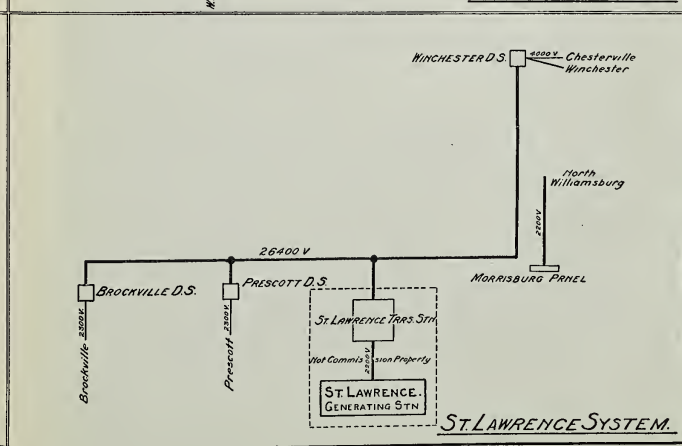
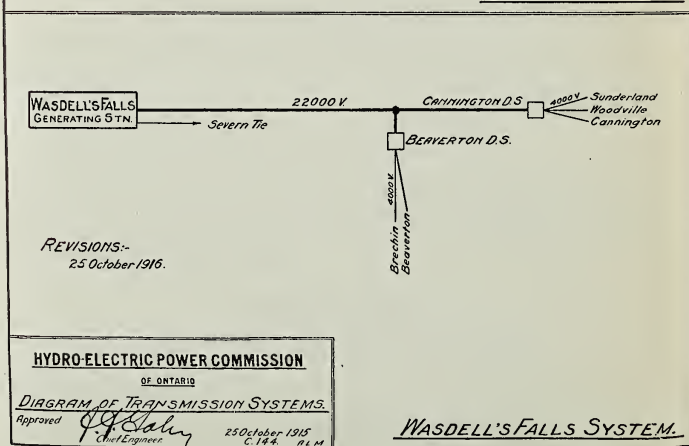
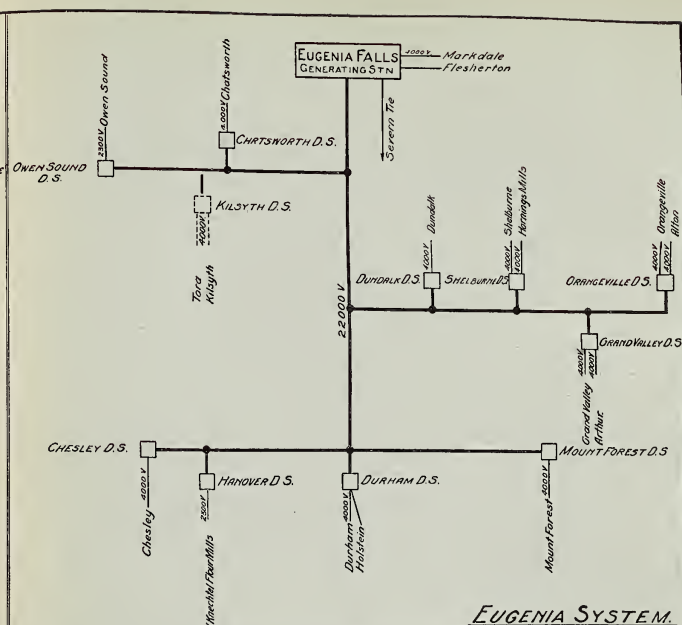
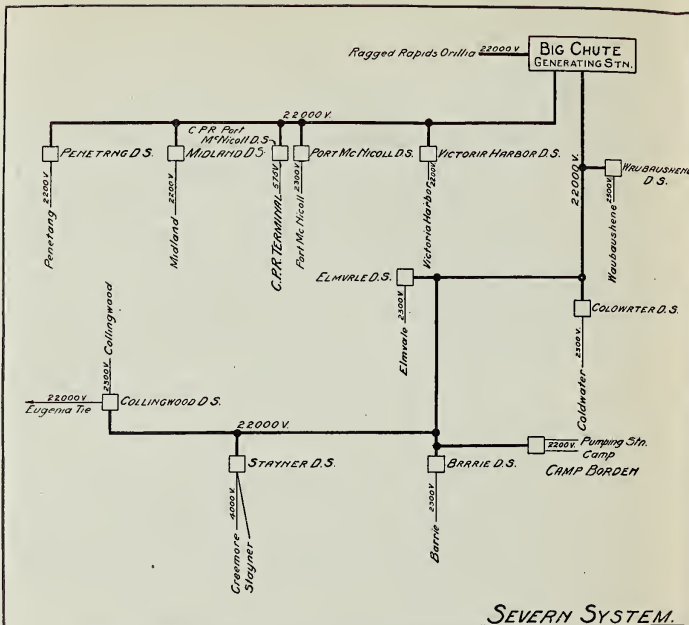
Plans showing the changes in the station were prepared and the necessary additional material was ordered. The installation was made by the Commission's Construction Department and was completed and put into service on May 1st. A 24-inch roof ventilator, purchased from the A. B. Ormsby Company, was also installed to obtain better ventilation for this station, required on account of the larger size of the transformers.

The 250-kv-a. transformers were shipped to Port McNicoll for installation in the distributing station at Canadian Pacific Railway Company's Terminal.

Port McNicoll (Canadian Pacific Railway) Distributing Station

Owing to the Canadian Pacific Railway Company having signed a contract for power for use in the elevator at Port McNicoll, a modified type "G" station was authorized. Plans were prepared and arrangements made with the Railway Company to install the Commission's equipment in their steam generating station. The necessary changes in the building were made by the Railway Company and the Commission installed the three 250-kv-a. 22,000/2,200/550-volt transformers which were transferred from Collingwood Distributing Station. A General Electric 22,000-volt K-21 oil switch, and an electrolytic lightning arrester was obtained from the Walkerville Hydro-Electric Commission and the remaining material required was purchased from Canadian General Electric Company and the Canadian Westinghouse Company, the latter supplying the metering equipment. Two incoming 22,000-volt, 60-cycle, 3-phase feeders supply this station and power is sold to the Railway Company at the low tension side of the transformers.

All the equipment in this station was installed by the Commission's Construction staff and the station was placed in operation on July 15th.



REVISIONS:-
25 October 1916.

HYDRO-ELECTRIC POWER COMMISSION
OF ONTARIO

DIAGRAM OF TRANSMISSION SYSTEMS.

Approved *J. G. Galt* 25 October 1916
Chief Engineer C. 144. 61.4



Camp Borden Municipal Station

Owing to the Commission having contracted to supply the Department of Militia and Defence with power for Camp Borden, a distributing station was authorized. Drawings were immediately prepared for a combined type "G" distributing station and pump house. The pump house which was 40 feet by 45 feet, and the distributing station, were built of brick by the Department of Militia and Defence, according to the plans prepared by the Commission.

The switching equipment was purchased by the Commission from the Canadian Westinghouse Company and consisted of one 22,000-volt type "E" oil switch with the necessary high-tension material, and two 2,200-volt feeders, with meter equipment for measuring the power on the 2,200-volt side of the transformers. The transformers were of Canadian Westinghouse Company's make, rated at 125-kv-a. 22,000/2,200-volt, 60 cycle, single-phase, and were purchased from the Pine River Power Company. There was also installed one 22,000-volt electrolytic lightning arrester, purchased from the Canadian General Electric Company. All of this equipment was installed in the distributing station.

In the pump house the installation consisted of two 150-h.p. 2,200-volt induction motors with starting compensators and relays to drive two belt-driven water pumps.

Foundations for this building were started about June 9th, and by June 21st work on the building was advanced sufficiently for the electrical construction work to commence. Work was started at once by the Commission's construction staff on the erection of all the electrical equipment for the distributing station and the pump house, and on June 29th this station was put into service, and one motor made ready for pumping. The second motor was ready for service on July 21st.

Coldwater Distributing Station

As the load at Coldwater Distributing Station did not warrant the transformer capacity installed, consisting of three 75 kv-a. Canadian General Electric Company's transformers and as use could be made of same at Grand Valley Distributing Station, it was decided to purchase two 25 kv-a. units and install them in place of the 75 kv-a. units. It was also decided to remove the 22,000 volt oil switch from this station and substitute fuses for same.

Accordingly two 25 kv-a. 22,000/2,300 volt transformers were purchased from the Moloney Electric Company and as soon as they are installed, the 75 kv-a. units with the oil switch will be removed and shipped to Grand Valley, and 22,000 volt "S & C." fuses installed to protect the transformers. This work was done by the Commission's construction staff.

EUGENIA SYSTEM

EUGENIA FALLS GENERATING STATION

Electrical Equipment

The characteristic tests on the generating equipment were completed early in November and the switching equipment tested out and the station was formally placed in service on November 19th.

Operators' Cottages

Owing to the isolated location of the Eugenia Generating Station it was found necessary to provide living accommodation for the operating staff. A single house and a pair of semi-detached houses were constructed in the vicinity of the Generating Station.

1916 Extension

It was decided to put in an additional 22,000 volt line with lightning arresters and metering equipment to be used as a tie line to Collingwood Station.

Plans were prepared showing necessary changes in the electrical equipment using the present transformer oil switch for the new line. The additional 22,000 volt apparatus and the switchboard panel with graphic wattmeters was purchased from the Canadian Westinghouse Company; three Weston ammeters were purchased from A. H. Winter Joyner.

The tie line was connected temporarily by the Commission's Construction Department on October 18th, and will be completed by them when all apparatus arrives at the station.

Markdale Municipal Station

The switchboard panel and constant current transformer referred to in last annual report to supply the street lighting system was installed and placed in service the early part of February.

Owen Sound Distributing Station

This station, described in last annual report, was placed in temporary service on November 18th, and equipment was permanently completed on January 30th. The electrical equipment was installed in this station by the construction staff of the Commission, and consists of three 550 kv-a. 22,000/2,300 volt, Canadian Westinghouse transformers fed from two 22,000 volt lines and protected with Canadian Westinghouse type "E" oil switches and choke coils and Canadian General Electric Company electrolytic lightning arresters. Provision is made for installation of a second similar bank of transformers at a later date.

Power is supplied at 2,300 volts to the Municipality's switching equipment consisting of one main oil switch between transformers and bus and two power feeders, one commercial lighting feeder, and one street lighting feeder. The two panels controlling the two steam driven units have been moved into the new building and arrangements made to synchronize one or both units with the Commission's system.

Chatsworth Distributing Station

The distributing station at Chatsworth, as described in previous report was completed and placed in service on November 18th.

Chesley Distributing Station

The distributing station at Chesley was completed early in March and placed in operation on June 18th.

A 16 kw., 6.6 ampere, 2,300 volt, 60 cycle, Canadian Westinghouse constant current transformer, purchased from the Municipality of Palmerston was installed in this station by the Commission's construction staff for the Municipality of Chesley, for street lighting service.

Durham Distributing Station

The distributing station at Durham was completed and placed in service on November 18th.

The 100 kv-a. 4,000 volt feeder to supply the Village of Holstein was installed by the Canadian General Electric Company, and was placed in service April 3rd.

Dundalk Distributing Station

The distributing station at Dundalk was completed and placed in service on November 18th.

Mount Forest Distributing Station

The installation of the electrical equipment was completed by the Canadian General Electric Company, and station was placed in service on November 18th.

A 20 kw. constant current transformer, the property of the Municipality, is installed in this station for street lighting service.

Hanover Distributing Station

Arrangements were made to supply power to the flour mills of Wm. Knechtel at Hanover. A temporary wooden building was erected on his property and two 40 kv-a. 22,000/2,200 volt Canadian Westinghouse Company transformers were transferred from Hornings' Mills Power House to Hanover and there installed. These transformers are protected on the 22,000 volt side by "S. & C." fuses and on the secondary side by a Canadian General Electric "K-3" 2,300 volt oil switch, obtained from the Commission's stores.

This station was put in service in September.

Shelburne Distributing Station

The original station was part of the property purchased from the Pine River Light and Power Company. The building was of brick with gable tin roof and contained three 50 kv-a. Allis Chalmers 22,000/2,200 volt transformers, one electrolytic 22,000 volt lightning arrester manufactured by the Canadian Westinghouse Company, and one small switchboard panel with voltmeter and ammeters.

The original electrical apparatus was removed to a temporary building along side of the old building and a contract was let to Messrs. Wells and Gray to remodel the building to resemble our standard type "H" station building.

New high tension switching equipment was ordered from the Canadian Westinghouse Company and a 2,000 volt feeder panel was transferred from the Pine River Power Company's power house. The temporary building was destroyed by fire before the apparatus was moved into the remodelled building and practically all the equipment was lost. In order to restore service two transformers of 25 kv-a. capacity, which had just been completed by the Moloney Electric Company for Coldwater Distributing Station, were rushed immediately to Shelburne by express, and installed temporarily in the remodelled brick building thus giving service to Shelburne after a very short interruption. New transformers for Shelburne Distributing Station were necessary and a contract was let to the Moloney Electric Company for three 50 kv-a. 22,000/2,300 volt transformers. These will be delivered in January, 1917. The new permanent switching equipment has been installed.

The Police Village of Hornings Mills is supplied from this station by a 4,000 volt feeder, the load on this feeder being measured on Canadian Westinghouse Company Type "RO" maximum demand meter mounted on the Shelburne feeder panel.

On the authority of the Corporation of Shelburne, a 12 kw. 6.6 ampere constant current Adams Bagnall transformer and a panel for same was ordered from the Northern Electric Company. This was installed temporarily in the Town Hall in April, by the Commission's construction staff. It will be transferred in a short time to the remodelled distributing station.

Orangeville Distributing Station

The old station of the Pine River Light and Power Company was deemed unsuitable and the construction of a new type "G" station building was authorized. The contract was awarded to Messrs. Wells and Gray of Toronto, at the end of July, for the construction of this building, but construction was not started for some time. A 22,000 volt type "K-21" Canadian General Electric Company oil switch was transferred from Coldwater Distributing Station and re-arranged and installed in this new building, with new 22,000 volt wiring and connecting material ordered from the Canadian Westinghouse Company. A 22,000 volt electrolytic lightning arrester of the latter company's make was transferred from the Pine River Light and Power Company's station at Hornings' Mills and installed.

The two 125 kv-a. 22,000/2,200 volt single phase transformers, one of Allis-Chalmers Bullock Company's make, the other of Canadian Westinghouse Company's make, which were purchased with the Pine River Light and Power Company's station at Orangeville will be overhauled and installed in the new building. A third 125 kv-a. transformer, to complete the bank, will be ordered in a short time. Two 4,000 volt feeder panels were transferred from Midland Distributing Station to Orangeville and remodelled to suit the requirements.

The old station will be kept in service until the equipment, excepting the transformers, is installed in the new building, and when this work is completed, the transformers will be moved.

On the authority of the Municipality of Orangeville, a contract was placed in September with A. H. Winter Joyner, Limited, for two 10 kw., 6.6 ampere, 2,300 volt, Adams Bagnall constant current transformers with two switchboard panels for same. When these are delivered, they will be installed in the new station by the Commission's construction staff, who are doing all the installation work in the new building.

The new station will receive power over one 22,000 volt line from the Eugenia transmission system.

Grand Valley Distributing Station

A type "H" station was authorized for Grand Valley and the contract was let in August for the construction of the building to Mr. H. G. Wynne, of Collingwood. This building was completed in September. The contract for the switching equipment was let to the Canadian General Electric Company. Three 75 kv-a. transformers of Canadian General Electric Company's make will be transferred from Coldwater Distributing Station. There will be two 4,000 volt feeders, one to supply the Municipality of Grand Valley, and the other to supply

the Municipality of Arthur. In addition to the standard equipment, there will be installed one 3 phase 20 kv-a. automatic voltage regulator on the Arthur 4,000 volt feeder and one 3 phase 10 kv-a. voltage regulator on the Grand Valley feeder. These regulators were purchased from the Canadian General Electric Company. Temporary service will be given these municipalities in November.

Kilsyth Distributing Station

The construction of a pole type distributing station near Kilsyth, to supply power to Kilsyth and to Tara has been authorized. This station will be equipped with one 75 kv-a. 3 phase 22,000/4,000 volt 60 cycle outdoor type transformer, and with two feeder circuits with metering equipment. A careful study of designs for pole type stations is being made, before proceeding with this station, in order to develop a satisfactory standard design of pole type stations for similar requirements.

SOUTH FALLS SYSTEM

SOUTH FALLS GENERATING STATION

The specifications for the building, transformers and switching equipment were completed and contracts were awarded to Messrs. Witchall & Sons, of Toronto, for the construction of the building, and to the Canadian General Electric Company, Limited, for all the electrical equipment, excepting meters and direct current circuit breakers. The indicating meters were ordered from the Weston Electrical Instrument Company through A. H. Winter Joyner, Limited, Toronto, and the recording meters were obtained from the Canadian Westinghouse Company. The direct current circuit breakers on the exciters were ordered from the Cutter Company.

The electrical apparatus supplied by the Canadian General Electric Company consists of one 750 kv-a. 3 phase, 60 cycle, 6,600 volt, 720 r.p.m. waterwheel type generator; one 20 kw. 125 volt, 1,200 r.p.m. compound wound exciter direct connected to a 35 h.p. 3 phase, 60 cycle, 220 volt induction motor; three 400 kv-a. single phase 60 cycle, 25,000/22,000—6,900/6,600/2,300 volt O.I.S.C. transformers; three 30 kv-a. 6,600/220/110 volt station service transformers; two 22,000 volt feeder equipments and four 6,600 volt feeder equipments. The old switchboard was dismantled and the old connecting cables removed and new equipment used to replace them.

The building extension is of pressed brick and steel construction with concrete floors and roof. A concrete roof was built over the older part of the station and a new concrete floor was also laid in this part of the building.

Owing to the difficulties in carrying on construction work, incident to the war conditions, this plant was not completed as early as had been expected.

The installation was completed and the new equipment placed in service in September. During the installation of this new equipment, the operation of the 450 kv-a. generator originally in this station and the service on the feeder to Gravenhurst was not interfered with.

One of the 22,000 volt electrolytic arresters supplied for this station was transferred to Camp Borden sub-station in August in order to complete the installation of protective equipment at that station. This will not be replaced at South Falls until the second 22,000 volt line is to be placed in service.

The 22,000 volt feeder to Huntsville was placed in service on August 24th, with temporary connections.

Plans are being considered at present for installation of a new belt driven exciter for this station.

Huntsville Distributing Station

The contract for the distributing station building at Huntsville mentioned in last annual report was awarded to Mr. F. Beston and a modified type "G" station building was constructed. The contract for electrical equipment required was placed with the Canadian General Electric Company. This equipment consists of one incoming 22,000 volt feeder with lightning arresters, three 300 kv-a. single phase 60 cycle, 22,000/2,300/575 volt transformers, and two 2,300 volt 3 phase feeders.

The building is of standard type with pressed brick walls, concrete floor and roof and is designed to accommodate transformers of 500 kv-a. size as well as a second incoming line. Provision was made for the future installation of additional 2,300 volt feeders.

The Corporation of Huntsville has installed in this station one 12 kw. 6.6 ampere constant current transformer, Adams Bagnall Company's make, also a control panel for same furnished by the Canadian General Electric Company.

Corporation of Huntsville

Constant Current Transformers

At the request of the Corporation of Huntsville, tenders were obtained and orders placed in February for one 12 kw. 6.6 ampere, 60 cycle constant current transformer and for the control panel and wiring for same. The transformer was purchased from the Northern Electric Company and is of Adams Bagnall Company's manufacture. The panel is of Canadian General Electric make.

Anglo Canadian Leather Company

Engineering assistance was given to the Anglo Canadian Leather Company in making witness tests at factory of Moloney Electric Company of Canada, Limited, at Windsor, on three 250 kv-a. 2,200/550 volt single phase 60 cycle O.I.S.C. transformers. A report of the tests was made to this company.

NORTHERN ONTARIO SYSTEM

Powassan Distributing Station

Lightning arrester equipment has been ordered for the Powassan sub-station from the Moloney Electric Company, which will be installed at an early date.

CENTRAL ONTARIO SYSTEM

Kingston Municipal Station

Three 75 kv-a. 13,200/2,300 volt transformers which the Canadian Westinghouse Company were holding to the order of the Commission, were loaned to the Kingston Utilities Commission and shipped the end of October. When released from Kingston, these will be used at Niagara Falls Transformer Station.

Table No. 1
CAPACITIES OF TRANSFORMERS INSTALLED OR ORDERED FOR COMMISSION'S STATIONS*
Total Capacity, 310,630 Kv-a.

Station	Voltage	Transformers Installed		Transformers Ordered		Total Station Capacity Kv-a.	System Capacity Kv-a.
		Mfr.	Kv-a.	Mfr.	Kv-a.		
NIAGARA SYSTEM.							
1. Niagara Transformer Station	25-Cycle					.....
	12,000—110,000	C. W. Co.	77,000	C. W. Co.	22,500	.....
	12,000—45,700	C. G. E. Co.	24,500	C. G. E. Co.	10,500	134,500	
2. Dundas Transformer Station	110,000—13,200	C. G. E. Co.	7,500	.....	.....	7,500	
Caledonia Dist. Station	13,200—2,300	P. T. Co.	450	.....	.....	450	
Watertown "	13,200—2,300	C. C. W. Co.	225	.....	.....	225	
Hagersville "	13,200—4,000	C. W. Co.	225	.....	.....	225	
Lynden "	13,200—4,000	C. W. Co.	225	.....	.....	225	
3. Toronto Transformer Station	110,000—13,200	C. G. E. Co.	32,500†	C. G. E. Co.	45,000	67,500	
4. London Transformer Station	110,000—13,200	C. G. E. Co.	8,750	.....	.....	8,750	
Dorchester Dist. Station	13,200—4,000	C. W. Co.	225	.....	.....	225	
Lucan "	13,200—4,000	C. G. E. Co.	225	.....	.....	225	
Delaware "	13,200—4,000	P. E. Co.	75	.....	.....	75	
Exeter "	13,200—4,000	C. G. E. Co.	300	.....	.....	300	
5. Guelph Transformer Station	110,000—13,200	C. W. Co.	3,000	.....	.....	3,000	
Acton Dist. Station	13,200—2,300	S. Co. of C.	225	.....	.....	225	
Georgetown Dist. Station	13,200—4,000	C. G. E. Co.	450	.....	.....	450	
Rockwood "	13,200—2,300	C. G. E. Co.	75	.....	.....	75	
Cheltenham "	13,200—575	C. G. E. Co.	225	.....	.....	225	
Fergus "	13,200—2,300	C. G. E. Co.	225	.....	.....	225	
Elora "	13,200—4,000	C. W. Co.	225	.....	.....	225	
6. Preston Transformer Station	110,000—6,600	C. G. E. Co.	3,000	.....	.....	3,000	
Breslau Dist. Station	6,600—2,300	C. W. Co.	225	.....	.....	225	
7. Kitchener Transformer Station	110,000—13,200	C. G. E. Co.	6,000	.....	.....	6,000	
New Hamburg Dist. Station	13,200—2,200	P. E. Co.	225	.....	.....	225	
Baden "	13,200—4,000	P. E. Co.	225	.....	.....	225	
Elmira "	13,200—4,000	C. W. Co.	225	.....	.....	225	
8. Stratford Transformer Station	{ 110,000—13,200	C. G. E. Co.	3,000†	.....	.....	.....
Listowel Dist. Station	110,000—26,400	C. W. Co.	5,000	.....	.....	8,000	
Harriston "	26,400—4,000	C. W. Co.	300	.....	.....	300	
"	26,400—4,000	C. G. E. Co.	225	.....	.....	225	
Tavistock "	26,400—4,000	C. C. W. Co.	225	.....	.....	225	

* Spare transformers are included.

† Transformers to be transferred to another station.

* Spare transformers are included. † Transformers to be transferred to another station.

Table No. 1—Continued
CAPACITIES OF TRANSFORMERS INSTALLED OR ORDERED FOR COMMISSION'S STATIONS*—Continued
Total Capacity, 310,630 Kv-a.

Station	Voltage	Transformers Installed		Transformers Ordered		Total Station Capacity Kv-a.	System Capacity Kv-a.
		Mfr.	Kv-a.	Mfr.	Kv-a.		
Milverton Dist. Station	26,400—4,000	C. G. E. Co.	225	.....	.....	225	225
Palmerston "	26,400—4,000	C. G. E. Co.	225	.....	.....	225	225
9. St. Mary's Transformer Station	110,000—13,200	C. G. E. Co.	3,000	.....	.....	3,000	3,000
St. Mary's Cement Dist. Station	13,200—13,200	C. G. E. Co.	1,500	.....	.....	1,500	1,500
10. Woodstock Transformer Station	110,000—13,200	C. G. E. Co.	3,000	.....	.....	3,000	3,000
Beachville Dist. Station	13,200—2,300	S. Co. of C.	150	.....	.....	150	150
Norwich "	13,200—2,300	S. Co. of C.	150	.....	.....	150	150
Embro "	13,200—4,000	C. G. E. Co.	225	.....	.....	225	225
11. St. Thomas Transformer Station	110,000—13,200	C. G. E. Co.	3,000	.....	.....	3,000	3,000
Port Stanley Transformer Station	13,200—920	C. W. Co.	1,110	.....	.....	1,110	1,110
Dutton Dist. Station	13,200—2,300	S. Co. of C.	150	.....	.....	150	150
West Lorne Dist. Station	13,200—4,000	C. W. Co.	225	.....	.....	225	225
12. Mimico Transformer Station	13,200—4,000	C. W. Co.	225	.....	.....	225	225
Port Credit Dist. Station	110,000—13,200	C. G. E. Co.	5,000	.....	.....	5,000	5,000
Cooksville "	13,200—2,300	C. C. W. Co.	900	.....	.....	900	900
Streetsville "	13,200—2,300	C. G. E. Co.	225	.....	.....	225	225
Woodbridge "	13,200—4,000	P. E. Co.	40	.....	.....	40	40
13. Brant Transformer Station	13,200—4,000	C. G. E. Co.	225	.....	.....	225	225
Waterford Dist. Station	110,000—26,400	C. G. E. Co.	225	.....	.....	225	225
Drumbo "	26,400—4,000	C. W. Co.	5,000	.....	.....	5,000	5,000
Ayr "	26,400—4,000	C. W. Co.	225	.....	.....	225	225
St. George "	26,400—4,000	C. G. E. Co.	225	.....	.....	225	225
Burford "	26,400—4,000	C. C. W. Co.	150	.....	.....	150	150
14. Kent Transformer Station	110,000—26,400	C. W. Co.	225	.....	.....	225	225
Wallaceburg Dist. Station	26,400—4,000	C. G. E. Co.	5,000	.....	.....	5,000	5,000
Tilbury "	26,400—4,000	C. G. E. Co.	450	.....	.....	450	450
Dresden "	26,400—4,000	C. G. E. Co.	300	.....	.....	300	300
Bothwell "	26,400—4,000	C. W. Co.	225	.....	.....	225	225
Thamesville "	26,400—4,000	C. W. Co.	225	.....	.....	225	225
Ridgetown "	26,400—4,000	C. W. Co.	225	.....	.....	225	225
Blenheim "	26,400—4,000	C. W. Co.	225	.....	.....	225	225

Table No. 2

STATION TRANSFORMERS ORDERED FOR MUNICIPALITIES AND COMMISSION
DURING FISCAL YEAR ENDING OCTOBER 31st, 1916

Station	Cycles	Voltage	Mfr.	No.	Kv-a. each	Total Kv-a.
Niagara Falls Trans. Station.....	25	12,000-45,700	C.G.E.Co.	3	3,500	10,500
	25	12,000-63,500	C.W.Co.	3	7,500	22,500
Welland Municipal Station.....	25	13,200- 2,300	C.W.Co.	3	150	450†
Port Robinson Dist. Station.....	25	13,200- 2,300	P.E.Co.	3	75	225†
Toronto Transformer Station.....	25	63,500-13,200	C.G.E.Co.	9	5,000	45,000
London Transformer Station—						
Exeter Dist. Station.....	25	13,200- 2,300	C.G.E.Co.	3	100	300
Guelph Transformer Station—						
Guelph Municipal Station.....	25	13,200- 2,300	C.G.E.Co.	1	550	550
Preston Transformer Station.....	25	63,500-13,200	C.G.E.Co.	2	750	1,500†
Stratford Transformer Station—						
Stratford Municipal Station....	25	26,400- 2,300	C.G.E.Co.	3	750	2,250
Seaforth Municipal Station.....	25	26,400- 2,300	C.G.E.Co.	3	150	450
Mitchell Municipal Station.....	25	26,400- 575	C.G.E.Co.	3	75	225
Tavistock Dist. Station.....	25	26,400- 2,300	C.C.W.Co.	3	75	225
Milverton Dist. Station.....	25	26,400- 4,000	C.G.E.Co.	3	75	225
Harriston Dist. Station.....	25	26,400- 4,000	C.G.E.Co.	3	75	225
Palmerston Dist. Station.....	25	26,400- 4,000	C.G.E.Co.	3	75	225
St. Thomas Transformer Station..	25	63,500-13,200	C.G.E.Co.	2	750	1,500†
St. Thomas Municipal Station..	25	13,200- 2,300	C.G.E.Co.	2	750	1,500
West Lorne Dist. Station.....	25	13,200- 2,300	C.W.Co.	3	75	225
Cooksville Transformer Station—						
Mimico Distributing Station....	25	13,200- 2,300	J. & P.Co.	3	300	900
	25	13,200- 2,200	C.C.W.Co.	3	150	450†
Brampton Municipal Station....	25	13,200- 575	M.E.Co.	3	300	900
Corporation of Weston.....	25	13,200- 550	A.C.B.Co.	3	150	450†
Brant Transformer Station—						
Paris Municipal Station.....	25	26,400- 2,300	M.E.Co.	3	150	450
Kent Transformer Station—						
Petrolia Distributing Station...	25	26,400- 2,300	C.G.E.Co.	3	150	450
Forest Distributing Station.....	25	26,400- 2,300	C.W.Co.	3	75	225
Sarnia Municipal Station.....	25	26,400- 4,000	C.G.E.Co.	3	750	2,250
Big Chute Power House—						
Collingwood Dist. Station.....	60	22,000- 2,300	C.G.E.Co.	3	400	1,200
Port McNicoll Dist. Station.....	60	22,000- 550	C.G.E.Co.	3	250	750†
Camp Borden Municipal Station.	60	22,000- 2,200	C.W.Co.	3	125	375†
Coldwater Dist. Station.....	60	22,000- 2,300	M.E.Co.	2	25	50
Eugenia Falls Generating Station—						
Hanover Dist. Station.....	60	22,000- 2,200	C.W.Co.	2	40	80†
Shelburne Dist. Station.....	60	22,000- 2,300	M.E.Co.	3	50	150
Orangeville Dist. Station.....	60	22,000- 2,200	C.W.Co.	1	125	
			A.C.B.Co.	1	125	250†
South Falls Generating Station—	60	25,000- 2,300	C.G.E.Co.	3	400	1,200
		6,600- 110	C.G.E.Co.	3	30	90
Huntsville Dist. Station.....	60	22,000- 2,300	C.G.E.Co.	3	300	900

† Transformers transferred from other stations.

Total Kv-a., 99,1

LOW-TENSION TRANSMISSION LINES

On October 31st, 1916, there were completed and under construction 1,321 miles of low tension transmission lines, of voltages varying from 46,000 volts to 2,200 volts.

The mileage of these lines is distributed among the various systems as follows:

Niagara System—840.32 miles.

St. Lawrence System—66.35 miles.

Severn System—102.94 miles.

Wasdell's Falls System—65.85 miles.

Eugenia Falls System—219.41 miles.

Muskoka System—26.32 miles.

In the construction of these lines, 8,960 miles of wire, weighing 5,513,923 lbs., and 54,372 wood poles were used.

On the transmission line poles 1,126 miles of single circuit telephone line has been erected for use in operating the system.

During the year 10 gangs were employed, 2 of which, under the direction of a forestry expert were employed solely in trimming trees. These gangs constructed 229 miles of transmission lines as well as distributing systems in 7 towns and villages, and rural lines in 5 townships.

For the above lines 230 crossing plans were prepared and submitted to telephone and railway companies for approval.

The low tension distributing systems were constructed by the commission in the towns and villages of Chesley, Shelbourne, Victoria Harbour, Markdale, Holstein, Orangeville, Grand Valley, and rural lines in the townships of Toronto, Etobicoke, Vaughan, Grantham and Zone.

Although handicapped by a scarcity of labour, and difficulty in obtaining material, some important lines were successfully constructed in record time, to the great satisfaction of the communities benefitted thereby. Among these are Barrie Tap to Camp Borden, Eugenia Falls to Collingwood, and Niagara Falls to Ontario Power Company's Line.

Description

NIAGARA

Sec. No.	From	To	Length of pole	Span	Miles	No. of Poles
L.T.			feet	feet		
1	Dundas Sub. H.E.P.C....	Junction Pole No. 134....	40	120	2.84	134
2	Junction Pole No. 134....	Beach Pump House.....	40	120	6.34	323
3	" " No. 134....	Asylum	50	120	1.13	67
4	Berlin Sub. H.E.P.C....	Junction Pole No. 10	40	.....	.18	10
5	Junction Pole No. 10....	Waterloo	40	120	1.64	78
6	" " No. 10....	Berlin Corp. Station....	45	120	.76	35
7	Berlin Sub. H.E.P.C....	New Hamburg.....	40	120	12.27	556
8	Woodstock " " " "	Ingersoll	40	120	9.90	455
9	" " " " " "	Junction Pole No. 508....	40	120	11.12	508
10	Junction Pole No. 508....	Tillsonburg.....	40	120	10.30	467
11	" " " " No. 508....	Norwich.....	40	120	4.59	207
12	St. Thomas Sub. H.E.P.C.	St. Thomas Corp. Station	40 & 45	120	1.13	50
13	Stratford " " " "	Stratford " " " "	40 & 45	120	1.75	78
14	Preston " " " "	Junction Pole No. 99....	45	120	2.04	99
15	Junction Pole No. 99....	Hespeler.....	40	120	2.08	99
16	" " " " No. 99....	Galt.....	40	120	3.75	173
17	Preston Sub. H.E.P.C....	Preston Corp. Station....	35	120	.14	11
These poles also carry Section L.T. 35						
18	London Sub.	Junction Pole No. 38....	40	120	.79	38
19	Junction Pole No. 38....	Asylum, London	45	120	1.54	70
20	" " " " No. 38....	Junction Pole No. 93....	40	120	1.22	55
21	London Sub. H.E.P.C....	London Sub. No. 1.....	40	120	3.56	178
22	Junction Pole No. 93....	" " " " No. 1.....	40	120	1.71	96
23	" " " " No. 93....	" " " " No. 2.....	40	120	.31	20
24	London Sub. No. 1.....	Springbank	40	120	3.55	156
25	Dundas Sub. H.E.P.C....	Dundas Town.....	40 & 45	120	.98	58
26	Cooksville Sub. H.E.P.C.	Port Credit L.S. Road ...	40	120	2.74	129
26a	Pt. Credit L.S. Road....	Port Credit Brick Works	45	120	.24	14
27	Cooksville Sub. H.E.P.C.	Brampton	40	120	11.24	510
These poles also carry Section L.T. 34 Circuits						
28	Junction Pole No. 1547...	Clinton.....	40	120	1.27	78
29	" " " " No. 1152....	Seaforth.....	40	120	1.50	74
30	" " " " No. 648....	Mitchell	40	120	1.27	63
31	Guelph Sub. H.E.P.C....	O. A. College.....	40	120	1.56	77
32	" " H.E.P.C. Sub. Property.....	}	40	120	.09	8
18 poles on Station						
34	Cooksville Sub. H.E.P.C..	Weston.....	40	120	14.07	551
These Circuits carried on						
35	Preston Sub. H.E.P.C....	G. P. & H. Ry.....	40	120	.12	6
These Circuits carried on						
36	Junction Pole No. 84, Port Credit.....	Mimico (New Toronto)...	45	120	5.75	266
38	Dundas Sub. H.E.P.C....	Dom. Sewer Pipe Works..	40	120	7.35	350
39	Hamilton Asylum P.H..	Hamilton Asylum.....	35	120	.63	30
40	Junction Pole No. 260....	Waterdown	35	120	1.50	72
40a	Dom. Sewer Pipe Works.	Junction Pole No. 260....	.....	.....	1.92	.....
41	St. Thomas Sub. H.E.P.C.	Port Stanley.....	35	120	12.27	573
42	Junction Pole, No. 290, L.T. 8	Standard White Lime Co. ....	.....	.....	1.00	2
These circuits carried on Section						
43	Dundas Sub. H.E.P.C....	Jno. Bertram & Son....	40	120	1.21	10
These Circuits carried on Section						
44	Baden Sub.	Wellesley	30	150	7.92	316
45	Junct. Pole No. 240 L.T. 8	Beachville	40	120	.09	3
46	St. Mary's Sub.	St. Mary's Cement Works	40	120	2.22	80

of Lines.
SYSTEM.

Voltage	No. of Circuits	Power Cables B. & S. Gauge	Telephone Wires, B. & S & B. W. G. Gauge	Ground Wire	Work Commenced	Work Completed	In Operation
13,200	2	No. 1 1/0 Alum	10 Copper	1" Gal. Steel	July 13, 1910	Jan. 2, 1911	
"	2	1/0 "	10 "	1" "	July 13, "	Jan. 2, "	
"	1	2 "	10 "	1" "	Dec. 5, "	Feb. 8, "	
"	2	1/0 "	10 "	1" "	Aug. 25, "	Sept. 11, 1910	
"	2	1/0 "	10 "	1" "	Sept. 11, "	Nov. 25, "	
"	2	1/0 "	10 "	1" "	Aug. 25, "	Sept. 11, "	
"	2	2 "	10 "	1" "	Sept. 11, "	Jan. 2, 1911	Feb. 3, 1911
"	2	1/0 "	10 "	1" "	Nov. 14, "	Mar. 28, "	
"	2	1/0 "	10 "	1" "	Jan. 2, 1911	Apr. 29, "	
"	2	1/0 "	10 "	1" "	Jan. 2, "	Apr. 29, "	
"	1	2 "	10 "	1" "	Feb. 13, "	Mar. 30, "	
"	2	1/0 "	10 "	1" "	Dec. 14, 1910	Dec. 30, 1910	
"	1	2 Copper	10 "	1" "	Built by Corporation		
6,600	3	{ 1-2 Alum	10 "	1" "	Oct. 8, 1910	Jan. 19, 1911	
"	1	2 Alum	10 "	1" "	Oct. 8, "	Dec. 30, 1910	
"	2	4/0 "	10 "	1" "	Oct. 8, "	Jan. 19, 1911	
"	1	2 Copper	10 "	1" "	Built by Corporation.		
circuits to G. P. H. Railway Sub.							
13,200	2	{ 1-3/0 Alum	10 Copper	1" "	Oct. 26, 1910	Jan. 10, 1911	
"	1	1-2 "	10 "	1" "	Oct. 26, "	Jan. 19, "	
"	1	3/0 "	10 "	1" "	Oct. 24, "	Jan. 21, "	
"	1	3/0 "	10 "	1" "	Oct. 20, "	Jan. 20, "	
"	2	{ 1-3/0 "	10 "	1" "	Dec. 23, "	Jan. 20, "	
"	1	1-1/0 "	10 "	1" "	Dec. 23, "	Jan. 20, "	
"	1	1/0 "	10 "	1" "	Dec. 23, "	Jan. 20, "	
"	1	1/0 "	10 "	1" "	Jan. 1, 1911	Jan. 7, "	
2,200	1	{ 400,000c.m. Alum	Copper }	.....	Dec. 1, 1910	Jan. 1, "	
13,200	2	2 Alum	10 Copper	1" Gal. Steel	Feb. 24, 1911	July 10, "	
"	2	2 "	10 "	1" "	Apr. 5, "	July 23, "	
"	2	2 "	10 "	1" "	Feb. 15, "	May 6, "	
from poles No. 1 to 89—1.94 miles							
26,400	2	3/0 Alum	10 Copper	1" "	Apr. 6, "	Aug. 4, "	
"	2	2 Alum	10 "	1" "	Mar. 25, "	Sept. 13, "	
"	2	2 "	10 "	1" "	Mar. 24, "	Aug. 3, "	
13,200	1	1/0 "	10 "	1" "	July 21, "	Nov. 9, "	
550d.c.	1	} Municipal lines					
2,200a.c.	4						
13,200a.c.	3						
Property in all.		1/0 Alum	10 Copper	1" "	Aug. 7, 1911	Sept. 3, 1911	Sept. 4, 1911
13,200	2	2 Alum	8 Copper	1" "	Apr. 19, "	July 24, "	
Section L.T. 27 poles, 1 to 89, inclusive							
6,600	1	1/0 Alum	10 Copper	1" "	Mar. 13, "	Mar. 21, "	
Section L.T. 17 poles, 1 to 11, inclusive							
13,200	1	2 Alum	8 Copper	1" "	Apr. 26, "	Feb. 29, 1912	
"	1	2 "	8 "	1" "	July 21, "	Dec. 19, 1911	Apr. 6, 1912
2,200	2	4 Copper	10 "	.....	Sept. 6, "	Oct. 27, "	Apr. 6, "
13,200	1	2 Alum	8 "	1" Gal. Steel	Sept. 30, "	Oct. 10, "	Apr. 6, "
"	1	2 "	8 "	1" "	Sept. 30, "	Oct. 7, "	Mar. 1, "
"	1	2 "	8 "	1" "	Oct. 16, "	Mar. 8, 1912	Mar. 9, "
2,200	1	2 "	.....	.....	.....	.....	.....
L.T. 8 poles, from Beachville pole 290 to pole 240.							
13,200	1	2 Alum	10 Copper	1" Gal. Steel	Dec. 1, 1911	Dec. 19, 1911	Dec. 21, 1911
L.T. 25 poles, 1 to 58 inclusive.—.98 miles							
4,000	1	4 Copper	.....	6 B.W.G. Iron	May 16, 1916	Aug. 11, 1916	Oct. 23, 1916
13,200	1	1/0 Alum	8 Copper	1" Gal. Steel	June 1, 1912	June 29, 1912	July 17, 1912
"	1	3/0 "	8 "	1" "	July 15, "	Aug. 19, "	Sep. 7, "

Description of

NIAGARA

Sec. No.	From	To	Length of Pole	Span	Miles	No. of Poles
47	Dundas Sub	Caledonia.....	feet 40	feet 120	14.36	674
47a	Caledonia	Paris Alabastine Co.....			.22	.....
48	Caledonia	Junction Pole No. 940....	40	120	5.87	267
49	Junction Pole No. 940....	Hagersville	40	120	3.79	176
50	" No. 940....	Lythmore.....	40	120	4.98	230
55	St. Thomas Sub. H.E.P.C.	L.L.E. Ry. Sub.....	40	120	1.68	88
56	Port Credit	Toronto Golf Club.....	30	120	3.24	11
56a	Extension from Sect. L.T.				Carried on Section	
	56 on T.G.C. property..				.90	37
57	O. A. College.....	Guelph Prison Farm. Pole				
		156.....	40	120	1.93	86
57a	Guelph Prison Farm	Property	40	120	.08	4
58	Guelph Prison Farm, Pole					
	156.....	Junction Pole No. 454....	40	120	6.42	297
59	Junction Pole No. 454....	Acton	40	120	5.82	268
60	St. Catharines	Port Dalhousie	30	120	3.18	142
61	Caledonia Sub.....	Caledonia .....			.30	.....
62	Junction Pole No. 230 L.T. 27	Milton.....	40	120	16.65	740
63	Preston Sub	Doon Twine Mill	35	120	4.18	208
64	Mimico Sub.....	Mimico Asylum.....			Carried on Section	
					1.51	17
65	Acton	Georgetown	40	120	9.03	411
66	Junction Pole No. 454....	Rockwood	35	120	1.64	77
68	Brant Station	Paris	40	120	3.21	152
69	"	Brantford	40	120	6.66	320
71	Waterloo	Elmira	40	120	10.93	518
72	Preston	Breslau	40	120	6.48	293
73	Niagara Falls.....	Junction Pole 113.....	48	250	5.00	113
74	Junction Pole 113.....	Union Carbide Co.....	48	250	10.50	235
75	" 303.....	Electric Steel & Metal				
		Co	48	250	1.93	45
76	Junction Pole No. 38, L.T. 18	Crumlin Junction.....	35	132	5.31	218
77	Crumlin Junction.....	Thorndale	35	132	7.91	310
78	"	Thamesford	35	132	6.85	281
79	Jct. Pole No. 381 L.T. 62	Streetsville.....	45	120	.43	19
81	Essex Station	Jct. Pole No. 55	45	120	1.10	55
82	Jct. Pole No. 55	Windsor.....	45	120	2.27	102
83	Jct. Pole No. 55.....	Walkerville.....	40	120	1.30	61
84	Kent Station.....	Chatham	40	132	1.93	99
85	Jct. Pole No. 118 L.T. 57	Jct. Pole No. 776, L.T. 85	40	120	14.61	658
86	" 776 " 85.	Elora	40	120	1.18	58
87	" 776 " 85.	Fergus	35	120	1.96	94
88	Paris	Junction Pole No. 313....	35-40	132	7.41	312
89	Jct. Pole No. 313 L.T. 88	Ayr	40	120	1.20	58
90	Jct. Pole No. 313 L.T. 88	Drumbo	35	132	6.83	284
91	Drumbo	Princeton	35	132	5.65	233
92	Drumbo	Plattsville	35	132	7.35	299
93	Jct. Pole No. 388 L.T. 77	Deller Bros	30	132	1.00	48
94	Jct. Pole No. 1005 L.T. 65	I. P. B. Co.....	35	132	.89	221
95	London	Lambeth (Pole No. 462)..	40	120	5.08	463
96	Lambeth (Pole No. 462) ..	Komoka Jct. (Pole No. 759)	40	120	10.15	298
97	Komoka Jct. (Pole No. 759)	Mt. Brydges (Pole No. 943)	40	120	6.58	184
98	Mt. Brydges (Pole No. 943)	Strathroy (Pole No. 1,368)	40	120	4.00	424
99	London	Lucan	35-40	132	9.27	783
99c	London	Lucan			19.18	.....
					21.51	.....
100	Niagara Falls	Elect. Devel. Co	45	100	These circuits carr ed	52

Lines—Continued

SYSTEM

Voltage	No. of Cir- cuits	Power Cables B. & S. Gauge	Telephone Wires, B. & S. & B. W. G. Gauge	Ground Wires.	Work Commenced	Work Completed	In Operation
13,200	1	3/0 Alum	8 Copper	1" Gal. Steel	May 10, 1912	Sept. 18, 1912	Sept. 20, 1912
2,200	1	2/0 Copper	.....	.....	Sept. 5, "	Sept. 18, "	" 20, "
Section L.T. 49 poles.							
13,200	1	3/0 Alum	8 Copper	1" Gal. Steel	June 22, "	Sept. 18, "	Sept. 20 "
"	1	2 "	10 "	1 1/4" "	Feb. 28, 1913	May 2, 1913	Aug. 15, 1913
"	1	3/0 "	8 "	1 1/4" "	June 15, 1912	Sept. 18, 1912	Sept. 20 "
"	1	2 "	8 "	1 1/4" "	Aug. 9, "	Oct. 11, "	Oct. 27, 1912
2,200	1	6 D.B.W.P.	Copper	.....	June 10, "	Aug. 3, "	Aug. 6 "
L.T. 36 poles							
2,200	1	6 "	.....	.....	Nov. 22, "	Jan. 3, 1913	Dec. 24 "
13,200	1	2 Alum	8 Copper	1 1/4" Gal. Steel	Aug. 19, "	Dec. 14, 1912	Dec. 14 "
"	1	2 "	10 "	1 1/4" "	May 14, 1913	May 19, 1913	Sept. 4 "
"	1	2 "	8 "	1 1/4" "	Aug. 19, 1912	Dec. 14, 1912	Dec. 14, 1912
"	1	2 "	8 "	1 1/4" "	" 19, 1912	Dec. 14, 1912	Dec. 14 "
2,200	1	1/0 "	.....	.....	Oct. 16, 1912	Nov. 21, "	Nov. 17 "
"	1	4 D.B.W.P.	Copper	.....	Nov. 20, 1912	Nov. 30, "	Nov. 30 "
Section L.T. 47 poles.							
13,200	1	3/0 Alum	10	1 1/4" Gal. Steel	Nov. 25, 1912	Mar. 13, 1913	Mar. 13, 1913
6,600	1	2 "	.....	.....	Dec. 2, 1912	Apl. 11, "	Apl. 1 "
L.T. 17 poles, No. 1 to 11, inclusive. L.T. 35 from 11 to 17 inclusive.							
2,200	1	2 Copper	.....	.....	Mar. 30, 1912	Feb. 3, "	Apl. 26 "
L.T., 36 poles							
13,200	1	3/0 Alum	10 Copper	1 1/4" Gal. Steel	Mar. 11, 1913	Aug. 1, "	Aug. 1 "
"	1	2 "	10 "	1 1/4" "	May 6, 1913	July 3, "	Aug. 1 "
26,400	2	3/0 Alum	10 "	1 1/4" "	Nov. 11, 1913	Jan. 2, 1914	Jan. 3, 1914
26,400	2	3/0 "	10 "	1 1/4" "	Dec. 15, 1913	Jan. 17, "	Jan. 17 "
13,200	1	2 "	10 "	1 1/4" "	May 17, 1913	Oct. 14, 1913	Oct. 25, 1913
6,600	1	2 "	10 "	1 1/4" "	Apr. 4, 1913	Dec. 23, 1913	Dec. 23, 1913
46,000	3	4/0 Copper	8 "	1 1/4" "	Mar. 15, 1914	} Steel Towers.	Aug. 20, 1914
46,000	3	4/0 "	8 "	1 1/4" "	Mar. 15, 1914		Aug. 20, 1914
46,000	1	2/0 "	8 "	1 1/4" "	July 11, 1914		Oct. 17, 1914
13,200	1	2 Alum	.....	1 1/4" "	Sept. 13, 1913	May 8, 1914	Jan. 27, 1914
"	1	2 "	.....	1 1/4" "	Oct. 10, 1913	Feb. 6, 1914	Feb. 6 "
"	1	2 "	.....	1 1/4" "	Oct. 13, 1913	Jan. 19, "	Jan. 27 "
"	1	2 "	10 Copper	1 1/4" "	Nov. 1, 1913	Nov. 24, 1913	Nov. 24, 1913
26,400	4	3/0 "	10 "	1 1/4" "	July 28, 1914	Sept. 6, 1914	Sept. 6, 1914
"	2	3/0 "	10 "	1 1/4" "	July 31, 1914	Sept. 18, 1914	Sept. 18 "
"	2	3/0 "	10 "	1 1/4" "	June 2, 1914	Aug. 1, 1914	Sept. 6 "
"	2	2/0 "	10 "	1 1/4" "	Oct. 21, 1914	Feb. 22, 1915	Feb. 1, 1915
13,200	1	3/0 "	10 "	1 1/4" "	June 3, 1914	Oct. 17, 1914	Oct. 22, 1914
"	1	3/0 "	10 "	1 1/4" "	Aug. 18, 1914	Oct. 28, 1914	Oct. 22 "
"	1	3/0 "	10 "	1 1/4" "	Aug. 1, 1914	Oct. 13, 1914	Oct. 22 "
26,400	1	1/0 "	10 "	1 1/4" "	July 21, 1914	Nov. 30, 1914	Dec. 1 "
"	1	1/0 "	10 "	1 1/4" "	Sept. 15, 1914	Nov. 30, 1914	Dec. 1 "
"	1	1/0 "	10 "	1 1/4" "	July 13, 1914	Nov. 30, 1914	Dec. 1 "
4,000	1	6 Copper	.....	1 1/4" "	Aug. 17, 1914	Nov. 30, 1914	Dec. 18 "
"	1	4 "	.....	1 1/4" "	Aug. 17, 1914	Nov. 30, 1914	Dec. 1 "
on L.T. 90 Poles							
4,000	1	6 "	.....	1 1/4" "	Mar. 19, 1914	Mar. 19, 1915	Mar. 19, 1915
13,200	1	1/0 Alum	10 Copper	1 1/4" "	June 10, 1914	June 31, 1914	July 3, 1914
"	1	3/0 "	10 "	1 1/4" "	Sept. 1, 1914	Nov. 30, 1914	Nov. 30 "
"	1	3/0 "	10 "	1 1/4" "	Oct. 15, 1914	Nov. 30, 1914	Nov. 30 "
"	1	3/0 "	10 "	1 1/4" "	Sept. 29, 1914	Nov. 30, 1914	Nov. 30 "
"	1	3/0 "	10 "	1 1/4" "	Sept. 14, 1914	Nov. 30, 1914	Nov. 30 "
"	1	2 S.R.	10 BWG Iron	1 1/4" "	Oct. 23, 1914	Jan. 20, 1915	Jan. 21, 1915
"	1	2 S.R.	.....	.....	July 3, 1916	.....	.....
on L.T. 18 poles 1 to 38, L.T. 19 poles 38 to 100 and L.T. 99.							
12,000	2	4/0 Copper	9 BWG Iron	1 1/4" Gal. Steel	Oct. 27, 1915	Oct. 31, 1915	Oct. 31 "

Description of
NIAGARA

Sec. No.	From	To	Length of Pole.	Span.	Miles	No. of Poles
101	Kent Sta. Pole No. 40....	Tilbury	feet 30	feet 132	16.91	85
102	Kent Station.....	Junction No. 68	40	120	15.00 miles carried	1.48 68
102a	"	Junction No. 68			1.48	.....
102b	"	Junction Pole No. 68.....			1.48	.....
103	Junction Pole 68, L.T. 102	Junction Pole No. 519....	40	120	9.98	451
103a	" " 68 L.T. 102	Junction Pole No. 519.....			9.98	.....
104	" " 519 L.T. 103	Wallaceburg	40	120	8.50	386
105	" " 519 L.T. 103	Dresden.....	40	120	7.40	309
106	" " 289 L.T. 8	Embro.....	35	132	6.10	254
107	" " 564 L.T. 34	Woodbridge.....	35	132	6.44	277
108	Woodbridge	Bolton	35-40	132	13.03	540
109	Junction Pole	W. T. & L.Ry .....			.02	2
110	Mimico Sub-Station	Prison Brick Yard.....	30	125	.71	32
111	Brant Sub-Station	Junction Pole 249.....	35-40	132	5.84	249
112	Junction Pole 249 L.T. 111	Burford	35	132	3.48	142
113	" " 249 L.T. 111	Waterford	35-40	132	14.20	616
114	Waterford	Simcoe	35	132	8.90	366
115	Tilbury	Comber	30	132	7.26	306
116	Delaware Sub-Station ...	Lambeth	40	120	6.58	.....
117	" " Junc. Pole 759..	Mount Brydges	40	120	4.60	.....
118	Bertram's Sub-Station, Pole No. 69-L.T. 43....	Dundas	55	.....	.37	21
119	Junction Pole 759L. T. 96	Delaware Sub-Station ...	55	120	.09	5
121	St. Thomas.....	Dutton	30	132	18.50	756
122	Ridgetown.....	Highgate			6.18	9
123	Junction Pole 68 L.T. 102	Thamesville	35	132	14.60	683
124	Junction Pole 676 L.T. 123	Bothwell	35	132	9.83	410
125	Stratford.....	Tavistock	35	132	9.72	398
126	Junction Pole 68 L.T. 102	Blenheim	35	132	9.52	390
127	Junction Pole 469 L.T. 123	Ridgetown.....	35	132	8.02	333
128	Brant	St. George	30	132	9.09	369
129	Dundas	Lynden	35	132	12.75	430
130	Lucan	Ailsa Craig	30	132	10.14	410
131	Dresden	Petrolia	35-40	125	21.78	947
132	Petrolia	Wyoming Jct. Pole 220 ..	40	125	4.85	220
133	Wyoming Jct. Pole 220 ..	Perch Jct. Pole 562.....	35	125	7.92	343
134	Lucan	Granton	30	132	6.95	246
135	Perch Jct. Pole 562.....	Sarnia	35	125	7.73	332
136	Lucan	Exeter	35	132	13.24	552
137	Petrolia	Wyoming	25	132	e 7.50	e 25
138	Sebringville Junction Pole 311 L.T. 67	Milverton Jct. Pole 802..	35	132	11.90	491
139	Milverton Jct. Pole 802..	Milverton	35	132	.96	40
140	" " 802..	Listowel Jct. Pole 1313 ..	35	132	12.65	512
141	Listowel Jct. Pole 1313..	Listowell.....	35	132	2.77	122
142	" " 1313..	Palmerston	35	132	10.48	451
143	Palmerston	Harriston	35	132	6.11	259
145	Wyoming Jct. Pole 1963.	Forest.....	35-40	132	e20.50	817
146	Stratford Sub	Jt. Pole 311 (Sebringville)	40	120	6.81	311
147	Jct. Pole 311(Sebringville)	Jct. Pole 648 (Mitchell)..	40	120	7.61	337
148	Jct. Pole 648 (Mitchell)..	Jct. Pole 1152 (Seaforth)..	40	120	11.36	505
149	Jct. Pole 1152 (Seaforth)	Jct. Pole 1547 (Clinton)..	40	120	8.84	395
150	Jct. Pole 1547 (Clinton)..	Goderich	40	120	13.61	612
151	Exeter	Hensall	30	132	e 5.04	e 205
152	Niagara Falls Sub	Ont. Power Co. Line.....	40	125	.31	17

Lines—Continued

SYSTEM

Voltage.	No. of Cir- cuits	Power Cable B. & S. Gauge	Telephone Wires, B. & S. & B. W. G. Gauge	Ground Wire	Work Commenced	Work Completed	In Operation
26,400 on H.T. Telephone	1	2 S.R. Alum Poles	10 BWG Iron	1/4" Gal. Steel	Jan. 13, 1915	May 12, 1915	Mar. 3, 1915
26,400	1	1/0 "	10 "	1/4" "	Oct. 28, 1914	Feb. 3, "	Feb. 3, "
"	1	3/0 "	"	"	June 22, 1915	June 29, "	June 29, "
"	1	3/0 "	"	"	Oct. 7, "	Oct. 13, "	Oct. 13, "
"	1	1/0 "	10 BWG Iron	1/4" Gal. Steel	Oct. 30, 1914	Feb. 3, "	Feb. 3, "
"	2	3/0 "	"	"	Oct. 12, 1915	Mar. 15, 1916	Mar. 15, 1916
"	1	1/0 "	10 BWG Iron	1/4" Gal. Steel	Nov. 6, 1914	Feb. 3, 1915	Feb. 3, 1915
"	2	3/0 "	10 "	1/4" "	Nov. 3, "	May 1, "	Mar. 30, "
13,200	1	1/0 "	10 "	1/4" "	Oct. 1, "	Dec. 24, 1914	Dec. 22, 1914
"	1	1/0 "	10 "	1/4" "	Sept. 25, "	Oct. 21, "	Dec. 2, "
"	1	1/0 "	10 "	1/4" "	Oct. 20, "	Nov. 26, "	Jan. 26, 1915
"	1	2 "	10 "	1/4" "	Sept. 12, "	Sept. 12, "	Sept. 13, 1914
2,200	1	2/0 Copper	"	"	Oct. 24, "	Feb. 17, 1915	Feb. 17, 1915
26,400	1	2 S.R. Alum	10 BWG Iron	1/4" Gal. Steel	Nov. 6, "	May 4, "	May 6, "
"	1	2 S.R. "	10 "	1/4" "	Nov. 21, "	May 28, "	May 6, "
"	1	2 S.R. "	10 "	1/4" "	Nov. 21, "	May 5, "	May 10, "
"	1	2 S.R. "	10 "	1/4" "	Nov. 26, "	May 7, "	May 9, "
4,000	1	1/0 Copper	"	1/4" "	Jan. 14, 1915	May 8, "	Apr. 20, "
"	1	6 Copper	"	1/4" "	Jan. 25, "	Mar. 12, "	Mar. 15, "
L.T. 96 poles							
4,000	1	6 M.H.D.	"	1/4" "	Jan. 7, "	Jan. 23, "	Mar. 1, "
L.T. 97 poles							
13,200	1	1/0 Alum	10 BGW Iron	1/4" "	Feb. 25, "	Mar. 15, "	Mar. 15, "
"	1	3/0 "	10 "	1/4" "	Jan. 27, "	Mar. 9, "	Feb. 1, "
4,000 v. circuit carried on L.T. 119 poles							
13,200	1	1/0 Alum	"	1/4" "	May 3, "	Aug. 21, "	Aug. 27, "
4,000	1	6 B.W.G. Iron	"	6 B.W.G. Iron	Oct. 3, 1916	Nov. 4, 1916	Nov. 6, 1916
H.T. relay poles.							
26,400	1	1/0 Alum	9 BWG. Iron	1/4" Galv Steel	May 18, 1915	July 14, 1915	Sept. 14, 1915
"	1	2 S.R. "	9 "	1/4" "	June 26, "	Aug. 17, "	Aug. 17, "
"	1	6 B.W.G. Iron	9 "	6 B.W.G. Iron	Sept. 9, "	Sept. 5, 1916	Oct. 26, 1916
"	1	2 S. R. Alum	9 "	1/4" Gal. Steel	July 2, "	Oct. 7, 1915	Oct. 20, 1915
"	1	2 "	9 "	1/4" "	June 24, "	Sept. 7, "	Nov. 24, "
4,000	1	2 "	9 "	1/4" "	July 1, "	Aug. 17, "	Aug. 17, "
On H.T. Tel. and Relay line							
13,200	1	2 S.R. Alum	9 BWG. Iron	1/4" "	July 24, "	Oct. 15, "	Oct. 22, "
4,000	1	2 S.R. "	"	1/4" "	July 28, "	Dec. 11, "	Dec. 15, "
26,400	2	3/0 "	9 BWG Iron	1/4" "	Aug. 30, "	Feb. 18, 1916	Apr. 6, 1916
"	2	3/0 "	9 "	1/4" "	Mar. 1, 1916	Sept. 12, "	Nov. 10, "
"	2	3/0 "	9 "	1/4" "	Apr. 6, "	Sept. 29, "	Nov. 10, "
4,000	1	6 Copper	"	6 B.W.G. Iron	Apr. 6, "	May 27, "	June 29, "
26,400	2	3/0 Alum	9 B.W.G. Iron	1/4" Galv. Steel	May 9, "	Nov. 4, "	Nov. 10, "
13,200	1	3/0 "	9 "	1/4" "	Nov. 26, 1915	May 4, "	May 4, "
4,000	1	6 Copper	9 "	"	Sept. 1, "	Oct. 4, "	Oct. 4, "
26,400	1	1/0 S.R. Alum	9 BWG. Iron	1/4" Gal. Steel	Sept. 20, "	May 15, "	May 18, "
"	1	2 "	9 "	1/4" "	Oct. 15, "	May 18, "	May 18, "
"	1	1/0 "	9 "	1/4" "	Oct. 13, "	May 22, "	May 27, "
"	1	2 "	9 "	1/4" "	Oct. 28, "	May 22, "	May 27, "
"	1	1/0 "	9 "	1/4" "	Oct. 14, "	June 6, "	June 6, "
"	1	1/0 "	9 "	1/4" "	Dec. 10, "	June 30, "	June 30, "
"	1	6 B.W.G. Iron	9 "	1/4" "	June 26, "	"	"
"	2	3/0 Alum	10 Copper	1/4" "	Apr. 23, 1913	June 4, 1914	Dec. 23, 1914
"	2	3/0 "	10 "	1/4" "	Apr. 23, "	June 4, "	Dec. 23, "
"	2	3/0 "	10 "	1/4" "	Apr. 23, "	June 4, "	Dec. 23, "
"	2	3/0 "	10 "	1/4" "	Apr. 23, "	June 4, "	Dec. 23, "
4,000	1	6 Copper	"	6 B.W.G. Iron	Sept. 11, 1916	"	"
12,000	2	2/0 "	"	"	Oct. 24, "	Nov. 1, 1916	Nov. 5, 1916

Description of

SEVERN

Sec. No.	From	To	Length of pole	Span	Miles	No. of Poles
S.L.			feet	feet		
1	Waubashene.....	Jct. Pole 193 (Coldwater).	40	120	4.29	193
2	Jct. Pole 193 (Coldwater).	Coldwater	40	120	1.16	55
3	" " 193 ..	Jct. Pole 903 (Elmvale)..	40	120	15.86	710
4	" " 903 (Elmvale) ..	Elmvale	40	120	.42	19
5	" " 903 ..	Jct. Pole 1110 (Phelpston)	40	120	4.55	207
6	" " 1110 (Phelpston).	Barrie.....	40	120	12.27	550
7	" " 1110 ..	Jct. Pole 1785 (Stayner) ..	40	120	15.07	675
8	" " 1785 (Stayner)...	Stayner	40	120	1.50	68
9	" " 1785 ..	Collingwood.....	40	120	11.86	530
10	Stayner	Creemore	35	120	7.67	348
12a	Waubashene Pole 540 ...	Victoria Harbor Jct. 730.	35	100	3.59	190
14a	Victoria Harbor Jct. 730 ..	Port McNicholl Jct. 969..	35	100	4.02	213
15	Port McNicholl Jct. 969 ..	Port McNicholl*.....	35	120	.50	35
17	Midland	Penetang	40	120	4.50	223
20	Port McNicholl Jct. 943 ..	C.P.R. Elevators.....	35	125	1.34	58
21	Jct. Pole 1590 S.L 6	Camp Bordon.....	35	132	14.34	604

ST.L.

ST. LAWRENCE

1	Morrisburg	Prescott.....	40	120	22.96	1,083
2	"	Winchester	40	120	16.29	747
3	Winchester	Chesterville	40	120	6.52	294
5	Prescott	Brockville	40	120	14.08	639
6	Morrisburg	North Williamsburg			6.50	.....
This circuit carried on St. L. 2 poles						

WASDELL'S FALLS

W.L.						
1	Waddell's Falls	Jct. No. 1 Pole 1203	40	120	25.50	1,203
1a	"	Junction Pole 183.....	40	120	3.94	.....
	Carried on W.L. 1 Poles					
2	Jct. No. 1 Pole 1203.....	Beaverton	40	120	1.47	70
3	Jct. No. 1 " 1203.....	Cannington	40	120	9.67	442
4	Beaverton	Gamebridge			6.50	.....
	Carried on Sec. W.L. 1 & 2 poles					
5	Gamebridge	Brechin			3.75	.....
	Carried on Sec. W.L. 1 poles					
6	Cannington	Woodville	30	120	5.15	147
7	Cannington	Sunderland	30	120	7.40	335
8	Jct. Pole 183 W.L. 1	Longford	35	132	6.41	269

EUGENIA FALLS

EFL			feet	feet		
1	Eugenia Falls Pwr. House	Chatsworth Sub-Station.	40	125	22.15	972
2	Chatsworth Sub-Station.	Owen Sound	40	125	9.22	394
3	Eugenia Falls.....	Flesherton	40	125	6.78	296
4	Flesherton Jct. Pole 296.	Durham Jct. Pole 964 ...	40	125	15.97	687
5	Durham Jct. Pole 964....	Mount Forest.....	40	125	15.70	692
6	Laurel Jct.....	Grand Valley	35	132	e8.50	357
7	Durham Jct. Pole 964....	Hanover Jct. Pole 1491 ..	40	125	12.09	526
8	Hanover Jct Pole 1491 ..	Chesley	40	125	11.06	473
9	Flesherton Jct. Pole 296.	Dundalk	40	125	11.73	500
10	Dundalk.....	Shelbourne	40	125	13.16	562

Lines.—Continued.

SYSTEM

Voltage	No. of Cir- cuits	Power Cable B. & S. Gauge	Telephone Wires, B.&S. & B.W.G. Gauge	Ground Wire	Work Commenced	Work Completed	In Operation
22,000	2	4/0 Alum	10 Copper	1" Gal. Steel	Sep. 20, 1912	Feb. 18, 1913	Feb. 24, 1913
"	1	2 "	"	1" "	Sep. 20, "	Feb. 18, "	Feb. 24 "
"	2	4/0 "	"	1" "	Sep. 25, "	Feb. 18, "	Feb. 24 "
"	1	2 "	"	1" "	Feb. 1, 1913	May 17, "	May 27 "
"	2	4/0 "	"	1" "	Oct. 20, 1912	Feb. 18, "	Feb. 24 "
"	2	2/0 "	"	1" "	Nov. 6, "	Apl. 5, "	April 6 "
"	2	3/0 "	"	1" "	Oct. 23, "	Feb. 18, "	Feb. 24 "
"	1	2 "	"	1" "	Jan. 24, 1913	Apl. 26, "	Sep. 25 "
"	2	3/0 "	"	1" "	Nov. 1, 1912	Feb. 18, "	Feb. 24 "
4,000	1	1/0 "	.....	1" "	Aug. 15, 1914	Oct. 25, 1914	Oct. 21, 1914
22,000	2	1/0 "	10 Copper	1" "	Apl. 1, 1916	May 5, 1916	July 24, 1916
"	2	1/0 "	"	1" "	Mar. 7 "	May 5 "	July 24 "
4,000	1	1/0 "	"	1" "	Oct. 15, 1914	Dec. 25, 1914	Dec. 24, 1914
22,000	1	2 "	"	1" "	June 7, 1911	July 18, 1911	July 18, 1911
"	2	1/0 "	9 B.W.G. Iron	1" "	Feb. 29, 1916	Apl. 14, 1916	July 24, 1916
"	1	6 Copper	9 " "	6 B.W.G. Iron	May 30 "	July 11, 1916	June 29 "

SYSTEM

26,400	1	3/0 Alum	10 Copper	1" Gal. Steel	Oct. 29, 1912	June 14, 1913	Oct. 23, 1913
"	1	3/0 "	"	1" "	June 4, "	Dec. 15, 1913	Dec. 18 "
"	1	3/0 "	"	1" "	Sept. 6, 1913	Feb. 17, 1914	Feb. 7, 1914
"	1	3/0 "	"	1" "	Oct. 16, 1914	Mar. 20, 1915	Apr. 4, 1915
2,200	1	6 Copper	.....	.....	Feb. 22, 1915	Mar. 20, "	Mar. 20, 1915

SYSTEM

22,000	1	1/0 Alum	10 Copper	1" Gal. Steel	Jan. 17, 1914	Sept. 28, 1914	Sept. 28, 1914
"	1	1/0 "	.....	.....	July 6, 1916	July 23, 1916	July 23, 1916
"	1	1/0 "	10 Copper	1" Gal. Steel	Mar. 30, 1914	Sept. 28, 1914	Sept. 28, 1914
"	1	1/0 "	"	1" "	Feb. 18, "	Sep. 28 "	Sep. 28 "
4,000	1	1/0 "	.....	.....	May 2, "	.....	Oct. 6 "
4,000	1	1/0 "	.....	.....	July 25, "	.....	Oct. 6 "
4,000	1	1/0 "	.....	1" Galv. Steel	May 19, "	.....	Oct. 19 "
4,000	1	1/0 "	.....	1" "	June 1, "	July 10, 1914	Oct. 19 "
22,000	1	1/0 "	9 B.W.G. Iron	1" "	Feb. 17, 1916	May 27, 1916	June 4, 1916

SYSTEM

22,000	2	3/0 Alum	9 BWG. Iron	1" Galv. Steel	Mar. 17, 1915	July 7, 1915	Nov. 18, 1915
"	2	3/0 "	9 "	1" "	Apr. 7, "	Sept. 24, "	Nov. 18 "
"	2	3/0 "	9 "	1" "	Apr. 10, "	July 21, "	Nov. 18 "
"	2	3/0 "	9 "	1" "	Apr. 13, "	July 11, "	Nov. 18 "
"	2	3/0 "	9 "	1" "	Apr. 26, "	Aug. 25, "	Nov. 18 "
"	1	6 Copper	9 "	1" "	July 21, 1916	.....	.....
"	1	3/0 Alum	9 "	1" "	Oct. 19, 1915	Aug. 19, 1916	June 18, 1916
"	1	3/0 "	9 "	1" "	Dec. 4 "	June 10, "	June 18 "
"	1	1/0 "	9 "	1" "	May 20 "	Aug. 14, 1915	Nov. 18, 1915
"	1	1/0 "	9 "	1" "	June 9 "	Aug. 24, "	Nov. 18 "

Description of
EUGENIA FALLS

Sec. No.	From	To	Length of pole	Span	Miles	No. of poles
11	Hanover Jct. Pole 1491..	Hanover	40	125	.76	34
12	Eugenia Falls.....	Markdale.....			6.50	.....
13	Eugenia Falls	Car'd on Sec. EFL 1, poles			7.50	.....
		Flesherton.....				
14	Durham Jct. 1326 E.F.L.5	Car'd on Sec. EFL 3, poles				
		Holstein	30	130	2.63	107
		Car'd on Sec. EFL 5, poles				
15	Junction Pole 1190	Kilsyth Sta.....	40	125	e 6.25	244
16	Kilsyth Station.....	Tara.....	40	125	e 7.25	311
17	Shelbourne	Orangeville	30	130	e14.61	e614
18	"	Horning's Mills	30	130	e 5.13	e215
19	Eugenia Falls	Meaford Jct. Pole 186...	35-40	132	4.00	186
20	Meaford Jct. Pole 186...	Collingwood	35-40	132	20.17	885
21	Orangeville.....	Alton	30	132	e 5.75	e253
22	Grand Valley	Arthur	30	120	e12.50	e539

MUSKOKA

M.L.	1	South Falls.....	Huntsville	35	132	26.32	1,142
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CENTRAL ONTARIO

C.O.S.	1607	Napanee.....	Newburgh (Haupt Paper Mills).....	30	132	(e)8.25
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(e) Estimated

Lines.—Continued
SYSTEM.—Continued

Voltage	No. of Cir- cuits	Power Cable B. & S. Gauge	Telephone Wires,B.&S. & B.W.G. Gauge	Ground Wire	Work Commenced	Work Completed	In Operation
22,000	1	1/0 S.R.Alum	9B.W.G. iron	1/4" Galv.Steel	Aug. 18, 1916	Sep. 16, 1916	Sep. 16,1916
4,000	1	2 S.R "	.....	.....	Dec. 28, 1915	Jan. 17 "	Feb. 8 "
4,000	1	2 S.R "	.....	.....	June 4 "	Aug. 16, 1915	Nov.18,1915
4,000	1	2 S.R. "	.....	.....	Dec. 10 "	Apl. 3, 1916	Apl. 3, 1916
22,000	1	6 B.W.G.iron	9 B.W.G.iron	1/4"Galv.Steel	Oct. 12, 1916	.....	.....
4,000	1	6 Copper....	9 "	1/4" "	Oct. 12 "	.....	.....
22,000	1	6 "	10 "	1/4" "	June 13 "	June. 15, 1916	June13,1916
22,000	1	6 "	10 "	1/4" "	June 13 "	June 13 "	June13 "
"	1	1/0 "	9 "	1/4" "	Aug. 21 "	Oct. 5 "	Oct. 6 "
"	1	1/0 "	9 "	1/4" "	Aug. 14 "	Oct. 5 "	Oct. 6 "
4,000	1	4 " ....	.....	6 B.W.G.iron	Oct. 17 "	Nov. 22 "	Nov.27 "
4,000	1	4 " ....	.....	6 "	Oct. 30 "	.....	.....

SYSTEM

22,000	1	2 S.R. Alum	Galv. 9 BWG. Iron	1/4"Galv. Steel	Aug. 6, 1915	Apl. 29, 1915	Aug.15,1916
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SYSTEM

4,000	1	6 Copper..	6 B.W.G.iron	Nov. 23, 1916		
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Total Mileage of Lines and Number of Poles

	To Oct. 31st, 1915	Oct. 31st, 1915, to Oct. 31st, 1916	Total to Oct. 31st, 1916
Total mileage low tension lines.....	1,092.13	229.06	1,321.19
Total mileage low tension lines completed	995.10	246.08	1,241.18
Total mileage low tension lines under construction..	97.03	80.01	80.01
Total mileage single circuit lines.....	738.50	199.30	937.80
Total mileage double circuit lines.....	323.44	29.76	353.20
Total mileage three circuit lines.....	29.09	.....	29.09
Total mileage four circuit lines.....	1.10	.....	1.10
Total mileage telephone lines complete.....	864.11	211.94	1,076.05
Total mileage telephone lines under construction..	86.89	50.23	50.23
Number of poles	41,203	13,169	54,372

NOTE.—Under total mileage low tension lines completed Oct. 31st, 1915, to Oct. 1916. 246.08 includes total mileage low tension under construction to Oct. 31st, 1915. 97.03.

Total Weights and Mileages of Cable and Wire
TRANSMISSION AND TELEPHONE LINES

Cable and Wire	Wire Miles				Weight in Pounds			
	Completed to Oct. 31st, 1915	Completed Oct. 31st, 1915 to Oct. 31st, 1916	Under con- struction to Oct. 31st, 1916	Completed and under con- struction to Oct. 31st, 1916	Completed to Oct. 31st, 1915	Completed Oct. 31st, 1915 to Oct. 31st, 1916	Under con- struction to Oct. 31st, 1916	Completed and under con- struction to Oct. 31st, 1916
Aluminum	3,630.69	375.49	24.34	4,030.52	2,507,234	254,367	20,250	2,781,851
Steel Reinforced								
Aluminum	394.44	214.09	.....	608.53	191,697	115,210	.....	306,907
Copper Wire	313.96	253.93	123.93	691.82	651,296	208,606	67,653	927,555
Copper Clad								
Steel Wire	1,123.82	15.62	.....	1,139.44	191,952	2,405	.....	194,357
Galv. Iron Wire . .	606.94	426.69	209.21	1,242.84	171,705	249,944	91,608	513,257
Galv. Steel								
Cable	983.70	212.91	50.23	1,246.84	623,272	134,899	31,825	789,996
Totals	7,053.55	1,498.73	407.71	8,959.99	4,337,156	965,431	211,336	5,513,923

Gauge, Length and Weight of Copper Clad Steel and Galvanized Iron Wire
TELEPHONE LINES

Gauge	Wire Miles				Weight in Pounds				Single Circuit Mileage			
	Completed to Oct. 31st, 1915	Completed Oct. 31st, 1915 to Oct. 31st, 1916	Under con- struction to Oct. 31st, 1916	Completed and under con- struction to Oct. 31st, 1916	Completed to Oct. 31st, 1915	Completed Oct. 31st, 1915 to Oct. 31st, 1916	Under con- struction to Oct. 31st, 1916	Completed and under con- struction to Oct. 31st, 1916	Completed to Oct. 31st, 1915	Completed Oct. 31st, 1915 to Oct. 31st, 1916	Under con- struction to Oct. 31st, 1916	Completed and under con- struction to Oct. 31st, 1916
No. 8 B. & S., C.C. steel..	207.52	.....	.....	207.52	50,842	.....	.....	50,842	103.76	.....	.....	103.76
No. 10 " " "	913.76	15.62	.....	929.38	143,124	2,405	.....	145,529	456.88	7.61	.....	464.49
No. 9 B.W.G. iron..	363.10	369.18	100.46	831.07	110,745	112,599	30,640	253,984	181.55	184.59	50.23	416.37
No. 10 " " "	243.84	38.48	.....	282.32	60,960	9,620	.....	70,580	121.92	19.74	.....	141.66
Totals...	1,728.22	423.28	100.46	2,250.29	365,671	124,624	30,640	520,935	864.11	211.94	50.23	1,126.28

Gauge, Length and Weight of Conductors
TRANSMISSION LINES

	Wire Miles		Weight Pounds			Miles Single Circuit Lines			Miles Double Circuit Lines			Total Single Circuit and Double Circuit Lines completed Oct. 31, 1916
	Completed to Oct. 31, 1915	Completed to Oct. 31, 1916	Completed to Oct. 31, 1915	Completed to Oct. 31, 1916	Under construc- tion to Oct. 31, 1916	Completed to Oct. 31, 1915	Completed to Oct. 31, 1915, to Oct. 31, 1916	Under construc- tion to Oct. 31, 1916	Completed to Oct. 31, 1915	Completed to Oct. 31, 1915 to Oct. 31, 1916	Under construc- tion to Oct. 31, 1916	
Brown & Sharpe Gauge												
400,000 c.m. Alum.	1.54	.....	3,032	.....	.....	.49	.....	.....	.....	.....	.....	.49
4/0 Aluminum.....	183.85	.....	243,049	.....	.....	.....	.....	.....	30.49	.....	.....	30.49
3/0 ".....	1,846.43	195.07	1,536,229	162,298	20,250	181.11	36.39	.....	201.43	12.77	7.73	431.70
2/0 ".....	89.46	.....	58,954	.....	.....	.....	.....	.....	14.20	.....	.....	14.20
1/0 ".....	876.33	168.68	458,320	88,219	.....	189.51	35.65	.....	44.30	8.95	.....	278.41
2 ".....	633.08	11.74	207,650	3,850	.....	114.12	3.73	.....	43.43	.....	.....	161.28
2 S.R. ".....	394.44	174.22	191,697	84,670	.....	125.22	55.31	.....	.....	.....	.....	180.53
1/0 S.R. ".....	.....	39.87	.....	30,540	.....	.....	12.66	.....	.....	.....	.....	12.66
250,000 c.m. Copper	1.54	.....	6,246	.....	.....	.49	.....	.....	.....	.....	.....	.49
4/0 Copper.....	154.35	.....	520,931	.....	.....	.....	.....	.....	16.75	.....	.....	16.75
2/0 ".....	9.00	.....	19,107	.....	2,059	2.86	.....	.....	.....	.....	.31	2.86
1/0 ".....	22.86	76.13	38,473	1,128,126	.....	7.26	24.17	.....	.....	.....	.....	31.43
2 ".....	10.71	.....	11,331	.....	.....	3.40	.....	.....	.....	.....	.....	3.40
4 ".....	28.06	24.94	18,659	16,585	38,224	7.65	7.92	18.25	.63	.....	.....	16.20
6 ".....	87.44	152.86	36,549	63,895	27,370	27.76	48.53	20.79	.....	.....	.....	76.29
6 B.W.G. Iron.....	.....	103.73	.....	59,698	.....	.....	.....	32.93	.....	.....	.....	.....
Totals.....	4,339.09	843.51	3,350,227	560,677	147,601	659.87	224.36	71.97	351.23	21.72	8.04	1,257.18

NOTE.—A total of 16.00 miles occurs twice in the total mileage, due to there being circuits of different conductor on the same line.

Total Mileage Low Tension Telephone Lines
COMPLETED AND UNDER CONSTRUCTION TO OCTOBER 31, 1916

Sect. No.	Miles	Sect. No.	Miles	Sect. No.	Miles	Sect. No.	Miles	Sect. No.	Miles	Sect. No.	Miles	Sect. No.	Miles
L.T. 1..	2.84	L.T. 26 A	24	L.T. 58	6.42	L.T. 96	6.58	L.T. 128	9.09	S.L. 1	4.29	E.F.L. 1	22.15
" 2..	6.34	" 27	11.24	" 59	5.82	" 97	4.00	" 129	12.75	" 2	1.16	" 2	9.21
" 3..	1.13	" 28	1.27	" 62	16.65	" 98	9.17	" 131	21.78	" 3	15.86	" 3	6.78
" 4..	1.18	" 29	1.50	" 65	9.03	" 99	19.18	" 132	4.85	" 4	.42	" 4	15.97
" 5..	1.64	" 30	1.27	" 66	1.64	" 100	1.25	" 133	7.92	" 5	4.55	" 5	15.70
" 6..	.76	" 31	1.56	" 68	3.21	" 101	16.91	" 135	7.73	" 6	12.27	" 6	8.50
" 7..	12.27	" 32	.09	" 69	6.66	" 102	1.48	" 136	13.24	" 7	15.07	" 7	12.09
" 8..	9.90	" 34	14.07	" 71	10.93	" 103	9.98	" 137	7.50	" 8	1.50	" 8	11.06
" 9..	11.12	" 35	.12	" 72	6.48	" 104	8.50	" 138	11.90	" 9	11.86	" 9	11.73
" 10..	10.30	" 36	5.75	" 73	5.00	" 105	7.40	" 139	.96	" 12 A	3.59	" 10	13.16
" 11..	4.59	" 38	7.35	" 74	10.50	" 106	6.10	" 140	12.65	" 14 A	4.02	" 11	.76
" 12..	1.13	" 39	.63	" 75	1.93	" 107	6.44	" 141	2.77	" 15	.50	" 11	6.25
" 13..	1.75	" 40	1.50	" 79	.43	" 108	13.03	" 142	10.48	" 17	4.50	" 12	E 7.25
" 14..	2.04	" 40 A	1.92	" 81	1.10	" 109	.02	" 143	6.11	" 20	1.34	" 13	E 14.61
" 15..	2.08	" 41	12.27	" 82	2.27	" 111	5.84	" 145	20.50	" 21	14.34	" 14	E 5.13
" 16..	3.75	" 43	1.21	" 83	1.30	" 112	3.48	" 146	6.81	" 22	22.96	" 15	E 4.00
" 17..	.14	" 45	.09	" 84	1.93	" 113	14.20	" 147	7.61	" 23	16.29	" 16	20.17
" 18..	.79	" 46	2.22	" 85	14.61	" 114	8.90	" 148	11.36	" 3	6.52	" 17	
" 19..	1.54	" 47	14.36	" 86	1.18	" 118	.37	" 149	8.84	" 5	14.08	" 18	
" 20..	1.22	" 48	5.87	" 87	1.96	" 119	.09	" 150	13.61	" 1	25.50	" 19	
" 21..	3.56	" 49	3.79	" 88	7.41	" 123	14.60			" 2	1.47	" 20	
" 22..	1.71	" 50	4.98	" 89	1.20	" 124	9.83			" 3	9.67		
" 23..	.31	" 55	1.68	" 90	6.83	" 125	9.72			" 8	6.41		
" 24..	3.55	" 57	1.93	" 94	5.08	" 126	9.52			" 1	26.32		
" 26..	2.74	" 57 A	.08	" 95	10.15	" 127	8.02						

Total 1,126.28

"E" estimated

Size of Telephone Wire used on Telephone Lines

COMPLETED OCT. 31, 1915-OCT. 31, 1916

Section No.	Mileage	Gauge	Section No.	Mileage	Gauge	Section No.	Mileage	Gauge
L.T. 125	9.72	No. 9 B.W.G. Iron	S.L. 12 A	3.59	No. 10 B.&S.C.C.Steel	E.F.L. 17	14.61	No. 10 B.W.G. Iron
" 132	4.85	" "	" 14 A	4.02	" "	" 18	5.13	" "
" 133	7.92	" "						
" 136	13.24	" "						
" 137	7.50	" "						
" 138	11.90	" "						
" 139	.96	" "						
" 140	12.65	" "						
" 141	2.77	" "						
" 142	10.48	" "						
" 143	6.11	" "						
E.F.L. 7	12.09	" "						
" 8	11.06	" "						
" 11	.76	" "						
" 19	4.00	" "						
" 20	20.17	" "						
W.L. 8	6.41	" "						
M.L. 1	26.32	" "						
S.L. 20	1.34	" "						
" 21	14.34	" "						
Total	184.59	.....	Total.	7.61	.....	Total.	19.74	

Size of Telephone Wire used on Telephone Lines

UNDER CONSTRUCTION OCT. 31, 1916

Section No.	Mileage	Gauge	Section No.	Mileage	Gauge
L.T. 135....	7.73	No. 9 B.W.G. Iron.	E.F.L. 6...	8.50	No. 9 B.W.G. Iron.
" 145....	20.50	" "	" 15...	6.25	" "
			" 16...	7.25	" "
Total.....	28.23		Total.....	50.23	

SECTION III

OPERATION OF THE SYSTEMS

NIAGARA SYSTEM

The operation of the Niagara System for the year 1916, was attended with gratifying success. In no other year, and especially since the war commenced, have the lines and apparatus of this system been called upon for such extraordinary duty. This condition was occasioned by the rapid recovery of industry together with the enormous development of the manufacture of war munitions in Canada.

During the months of November to April, inclusive, and from July to October, power was purchased for transformation and transmission from two, and indirectly three sources, the supplying plants being linked together by the Commission's Transforming Station at Niagara Falls. On April 30th, the temporary contract with the Toronto Power Company expired, and from this date until July 26th, when the first generating unit from the Canadian Niagara Power Company was connected, the total load of the Niagara System was carried by the Ontario Power Company. On August 21st, a second unit at the Canadian Niagara Power Company's Plant was paralleled with the first, and from this date until the end of October, the amount of power available from this company amounted to approximately 25,000 horse-power. As these generating stations were operating at maximum capacity, extreme caution was necessarily exercised in the operation of the system in order to preserve equilibrium at all times. Due credit is extended to the Ontario Power Company for the satisfactory service received during the year.

Electrical storms during the past year were much more frequent and severe than in previous years. The Niagara System was subjected to these storms on sixty different days. On eight days these storms traversed practically the entire system, and were particularly severe. The balance of the storms traversed only portions of the system, mainly in the Niagara Peninsula, Preston, Stratford and Chatham Districts, and were more or less severe. No total system interruption occurred from lightning causes during the summer, and when it is considered that the Commission has in operation approximately 1,200 miles of high and low tension lines overstretching a strip of Ontario approximately 215 miles long and averaging 60 miles wide, all lines being subjected to the accumulation of electrical discharges, which must be dissipated by passage to ground, the efficiency of the protective apparatus is strikingly evident.

Work of a special nature carried out by the Line Maintenance Department, and required by reason of the rapid increase of load, included the erection of a temporary 12,000 volt double circuit pole line of No. 4/0 copper conductor between the power house of the Canadian Niagara Company's station and a point (on the present line between the Hydro and Toronto Power Company Transforming Stations) approximately 1,800 feet south of the Commission's station. Both circuits of this pole line are still in service pending the installation of the balance of the underground feeders to the Canadian Niagara Power Company's plant.

The erection of a fourth No. 4/0 copper, three-phase circuit 15.5 miles long, on the 46,000 volt tower line between Niagara Falls and Welland was completed and placed in operation.

The single or three-phase circuit of No. 2 aluminum between the High Tension station and the Municipal Station at Dundas was replaced with a double circuit of No. 4 copper. Two 13,200 volt air break switches were erected in these

CURVE SHOWING MONTHLY INCREASE OF POWER LOAD OF MUNICIPALITIES NIAGARA SYSTEM OCT. 1910 to OCT. 1916

H. E. P. C.
ONTARIO

Horse-Power

120000

100000

80000

60000

40000

20000

1910 Oct. Nov. Dec. 1911 Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. 1912 Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. 1913 Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. 1914 Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. 1915 Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. 1916 Jan. Feb. Mar. April May June July Aug. Sept. Oct.

120000

100000

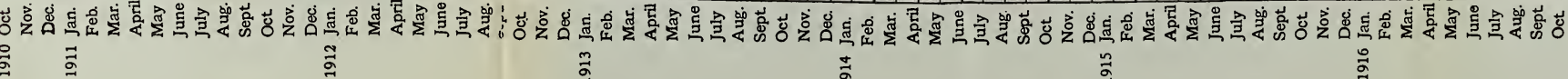
80000

60000

40000

20000

Horse-Power



lines at the entrance to the John Bertram and Sons Foundry, and also near the Dundas Municipal Station for the control of the line of the village of Lynden. The wood pole line from the Dundas High Tension to the City of Hamilton, which was replaced by a steel tower line during the summer of 1915, was taken down, and the material placed in stock.

Short stretches of single circuit 26,400 volt lines were constructed to supply the Lake Erie and Northern Railway Company's sub-stations at Brantford and Simcoe, from the outgoing circuits of Brant High Tension Station. This work also included the erection of telephone lines and instruments, and the installation of an air break switch at the Company's Simcoe sub-station.

The wood pole Low Tension Line entrances at London and St. Thomas, and at the Weston Municipal sub-station were remodeled to accommodate new lines erected in these districts. In view of the many new customers added in the Stratford District, and the length of line necessary to serve them, it has been decided to raise the transmission voltage in this district from 13,200 to 26,400. To this end considerable re-arranging of the power and telephone lines was carried out in preparation for this change. For sectionalizing purposes two air break switches were erected at Mitchell in the double circuit line between Stratford and Seaforth. The telephone line between Stratford and Sebringville Junction was doubled by the erection of a circuit of No. 9 iron wire.

Some re-location of the 13,200 volt line feeding the Mimico Distribution Station from the Cooksville High Tension Station was necessary, due to the construction of the Toronto-Hamilton Highway. The portion of line affected extended from Port Credit to New Toronto.

A twenty-five "pair" lead covered telephone cable approximately 13,500 feet long, was installed between the High Tension Station and the Commission's new office building at Toronto. The cable was laid in the Toronto Hydro-Electric System duct line to the corner of Queen and William Streets and from thence to the office building on the concrete poles.

Few failures of any of the electrical or mechanical equipment of the High Tension stations occurred during the year. As the Commission, in common with other enterprises in Canada, was severely handicapped in obtaining delivery on additional apparatus required to cope with the abnormal demand for power, the present equipment in some of the stations was subjected to overload for short periods, but without any depreciating results. The difficulty, mentioned above was partially met by the transfer, where feasible, of transformers from one station to another. One of the more important changes of this nature was the transfer of two 750 kv-a transformers from Guelph to the St. Thomas station.

The Commission now employs a staff of nine highly trained meter experts whose regular duties consist of the periodic calibration and adjustment of the various types of graphic recording and indicating instruments located in the Commission's stations.

These men also attend to the setting and adjustment of all relays used to protect the Commission's lines and equipment.

Considerable time has been spent in perfecting refinements in connection with the measurement of power, which has been to a great extent apparently considered unnecessary heretofore by the majority of other organizations. These refinements extend from the periodic comparison of the Commission's portable standard meters with ultimate standards to the determination of the characteristics of instrument transformers of various types.

The services of the meter inspectors may also be requisitioned by any of the Commission's customers to inspect or adjust metering and relay equipment, or to conduct special measurements of any loads with regard to which the customer is desirous of obtaining particular information.

A long felt want was realized in the erection of the storehouses on the High Tension Station ground during the summer. These buildings will accommodate maintenance materials of a bulky nature. This work, together with the building of suitable approaches, was done under the supervision of the operators. Outside lights surmounting concrete poles were installed at Dundas, London and Kent High Tension Stations, with pleasing effect. Considerable improvement in appearance was accomplished in grading the grounds surrounding the High Tension Stations, and re-surfacing of the roads through the grounds from the highway.

A concrete roadway approximately 300 feet long and 6 inches thick, was laid across the flats at Preston, from the fair grounds to the Hydro-Electric Power Commission's Property. It is expected that this roadway will be unaffected by the heavy spring floods in this vicinity, which previously rendered impassable the original gravel topped roadway. An increase was made in the supply of cooling water for this station by the sinking of a well just outside the station, and the installation of a deep well pump for pumping the water directly into the cooling system. The supply originally obtained from the small creek in the flats had latterly become inadequate.

The tables given below show the load demands of the various municipalities as well as the increase during the year.

The plotted curve on another page shows the monthly increase in the load supplied from October, 1910, to October, 1916.

NIAGARA SYSTEM

Capital Investments of the Niagara System in operation at October 31st, 1916:

Right-of-Way	\$1,034,920 58
Steel Tower Transmission Lines	3,403,585 05
Telephone Lines	129,706 69
Relay System Lines	54,537 32
Conduit System (Ontario Power Co. to Niagara Station)	96,698 64
Wood Pole Lines	1,785,208 01
Transformer Stations	2,797,209 61
Distributing Stations	221,130 02
	<hr/>
Total Operating Capital	\$9,522,995 92

Total expenditures in connection with the operation and maintenance of Niagara System for the Fiscal year 1915-16:

Operators' Salaries and Expenses, including Supplies	\$92,521 66
Maintenance of Steel Tower Lines	68,792 04
" Telephone and Relay Lines	15,422 41
" Low Tension Lines	20,350 09
" Transformer Stations	68,883 54
" Distributing Stations	7,514 28
Administration	44,811 77
	<hr/>
	\$318,295 79
Interest on Invested Capital	\$371,404 94
Cost of Power at Niagara Falls	997,257 60
	<hr/>
	1,368,662 54

Summary of Financial Statement of the Niagara System operation for fiscal year 1915-16:

Receipts

Power delivered, including charges for Administration, General Expense, Operation, Maintenance and Interest	\$2,038,792 32
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Disbursements

Power purchased, including losses in Transmission and Transformation, Administration, General Expense, Operation, Maintenance and Interest	1,686,958 33
	<hr/>
Surplus applicable to Sinking Fund and Depreciation Reserve Account	\$351,833 99

Municipality	Load in H.P. Oct., 1915.	Load in H.P. Oct., 1916.	Increase in H.P.
Toronto	32,748	38,465	5,717
Dundas	362	548	186
Hamilton	7,694.5	8,562	867.5
Waterdown	63	71	8
Caledonia	40.2	55	14.8
Hagersville	106	97.8	.....
London	5,971.5	7,359	1,377.5
Thorndale	28.4	34.8	6.4
Thamesford	19.3	26.5	7.2
Guelph	1,954.5	2,549.5	595
Ontario Agricultural College	153	160	7
Central Prison Farm	203.5	203.5	.....
Rockwood	34.2	11.9	.....
Georgetown	266.5	300	33.5
Acton	84.5	70.3	.....
Preston	973	1,149	166
Galt	1,602	2,285.5	683.5
Hespeler	368.5	450.4	81.9
Breslau	21.5	30	8.5
Kitchener	2,285.5	3,262	976.5
Waterloo	717	815	98
Elmira	91	109.9	18.9
New Hamburg	84.5	76.4	.....
Baden	157	196.5	39.5
Stratford	1,179.5	1,448	268.5
Mitchell	123.5	148.8	25.3
Seaforth	275	387.4	112.4
Clinton	98	101.8	3.8
Goderich	217	214.5	.....
St. Mary's	339	434.3	95.3
Woodstock	1,048	1,170	122
Ingersoll	740	792	52
Tillsonburg	233	242.6	9.6
Norwich	100.5	171.6	71.1
Beachville	132.5	96.5	.....
St. Thomas	1,658.5	2,011	352.5
Port Stanley	68.5	75	6.5
Brantford	1,552.5	1,783	230.5
Paris	381	398	17
Port Credit	57.5	59.6	2.1
Weston	178.5	197	16.5
Brampton	539	656.8	117.8
Milton	287	355	68
Mimico	127.5	156.1	28.6
Mimico Asylum	35	31.5	.....
Prov. Brick Yard	171	136	.....
New Toronto	80.5	291	210.5
Toronto Township	62.5	99.1	36.6
Cooksville	23	22.7	.....
Dixie .....	.....	.....	.....
Windsor	21 6	1,502.6	286.6
Walkerville	777.5	1,576.5	799
Elora	51.6	77.7	26.1
Fergus	68.5	92.5	24
Welland	3,038.5	5,626	2,587.5
St. Catharines	2,158.5	2,433	274.5
Port Dalhousie	104.5	79	.....
Strathroy	143.5	203.7	60.2
Drumbo	18	10.9	.....
Plattsville	32.2	57.6	25.4
Woodbridge	32.2	76.4	44.2
Ayr	35.5	36.2	.7
Princeton	9.8	10.4	.6
Embro	25	28.1	3.1
Chatham	431.5	509.4	67.9

Municipality.	Load in H.P. Oct., 1915.	Load in H.P. Oct., 1916.	Increase in H.P.
Lucan	33.5	30.2	.....
Bolton	34.8	95.2	60.4
Mount Brydges	26	26.8	.8
Wallaceburg	177	277.5	100.5
Delaware	7.2	8.9	1.7
Tilbury	60.3	63	2.7
Simcoe	114	103.2	.....
Waterford	35	97.8	62.8
Lambeth	50.9	17.9	.....
Grantham Township	12.3	17.4	5.1
Dresden	70	68.3	.....
Dorchester	20.7	16	.....
Comber	19.5	21.4	1.9
Burford	45.6	31.5	.....
Bothwell	28	28.1	.....
St. George	45.6	38.2	.....
Dutton	47	44.9	.....
Thamesville	52.9	45	.....
Blenheim	53.6	77.7	24
Lynden	6.7	79.7	73.1

A list of the municipalities connected to the Niagara System during the last year is given below.

Municipality.	Date connected	Initial Load in H.P.	Load in H.P. Oct., 1916	Increase in H.P.
Ailsa Craig	Dec. 15th, 1915	15.3	16	.7
Niagara Falls	Dec. 19th, 1915	371.3	2,364.5	1,993.2
Otterville	Jan. 15th, 1916	10	11.7	1.7
Petrolea	Apr. 25th, 1916	134	146	12
Exeter	May 4th, 1916	57	77.7	20.7
Milverton	May 18th, 1916	26.5	33.5	7.
Listowel	May 27th, 1916	90.3	117.9	27.6
Palmerston	June 6th, 1916	83.7	93	9.3
Granton	June 29th, 1916	10	12.4	2.4
Harriston	June 30th, 1916	56.3	52.9	.....
Wyoming	Oct. 4th, 1916	22.7	22.7	.....
Wellesley	Oct. 23rd, 1916	13.4	13.4	.....
Burgessville	Oct. 26th, 1916	8	8	.....
Tavistock	Oct. 26th, 1916	28	28	.....

SEVERN SYSTEM

The Commission's generating station at the Big Chute on the Severn River was overtaxed toward the middle of the fiscal year by the relatively large increase of the power demand of this district, as on the Niagara System, the increase in load resulting from the same cause. The steps taken to remedy this condition will be mentioned later.

The operation of the generating station, sub-stations and transmission lines was very satisfactory and the increased load was taken care of in a very creditable manner. The Trent Valley Canal contractors completed certain work on the canal scheme in the vicinity of the generating station which greatly benefited the control of the head and tail water at this plant. Other special maintenance work was carried out by which the hydraulic regulation was improved.

A slight change was effected in the construction of the power and telephone lines of the Power House-Waubashene Section where these lines cross Matcheash Bay, by the erection of an "A" frame structure with rock crib foundation to shorten this long span. This has eliminated trouble which was previously experienced at this point during very severe wind storms.

The temporary 22,000-volt pole type interswitching station at Waubashene was moved to a new location on the Commission's property and altered slightly in design. The change was made to accommodate additional lines built from this point and for more efficient control of all lines from this operating centre.

The work commenced in October, 1915, on the stringing of a second telephone circuit between Waubashene and the power house was completed and placed in operation in the late fall. The additional rod of right-of-way acquired on each side of the line from Midland to Penetang was cleared of trees through the bush section of that line.

Two new customers were connected to the Severn System lines during the year. Camp Borden, the new military training grounds prepared by the Department of Militia and Defence, was first supplied with power on June 29th, when the water pumps and the camp lighting was put in operation. The camp sub-station is fed over a single circuit of No. 6 copper tapped by means of airbreak switches on to the main transmission lines near the Barrie sub-station.

The elevator of the Canadian Pacific Railway at Port McNicoll was first supplied with Hydro power on July 25th. The Company's station is fed from a double circuit of No. 1/0 aluminum from the Midland-Penetang main line, which was double circuited from Waubashene to this point during the summer. This company is being supplied with approximately 1,000 h.p. of off peak power at 575 volts during the season of navigation, in addition to approximately 250 h.p. for the operation of wharf machinery, lighting, etc., which will be utilized throughout the entire year. Below will be found a list of the demands of the various municipalities in October, 1915 and 1916, and the increase during the year.

SEVERN SYSTEM

Municipality	Load in H.P. Oct., 1915	Load in H.P. Oct., 1916.	Increase in H.P.
Midland	500	815	315
Penetang	415.5	495	79.5
Collingwood	572.4	888.7	316.3
Barrie	368.6	541.5	172.9
Coldwater	37.5	34.8	.....
Elmvale	34.8	36.2	1.4
Stayner	81.7	56.3	.....
Creemore	48.2	38.8	.....
Orillia	1239.9	1414	174.1
Waubauskene	18.1	16.8	.....
Port McNicoll	23.4	19.3	.....
Victoria Harbor	29.5	26.8	.....

New Stations on Severn System

Customer	Date connected	Initial load in H.P.	Present load in H.P.	Increase in H.P.
Camp Borden,	June 29th, 1916.....	225	325.7	100.7
C.P.R. Elevator....	July 25th, 1916.....	600	1176.6	576.6

OPERATING STATEMENT, FISCAL YEAR 1915-16.

Capital Investment as at October 31st, 1916:

Big Chute Power Development, including Generating and Trans-	
former Station	\$349,787 46
Transmission Lines	335,497 20
Distributing Stations	78,451 08

Total Operating Capital \$763,735 74

Revenue as per details below

Midland Power Accounts	\$10,856 88
Penetang "	11,983 47
Collingwood "	23,613 38
Barrie "	13,970 30
Coldwater "	1,007 77
Elmvale "	1,335 50
Stayner "	2,800 01
Creemore "	2,254 47
Orillia "	13,229 32
Waubauskene "	640 19
Port McNichol "	698 22
Victoria Harbor "	1,762 98
Camp Borden "	3,592 45
C.P.R. Elevator "	6,949 99
	<u>\$94,694 93</u>

Expenditures

Operators' and Patrolmen's Salaries and Expenses	
and proportion of Administration and General	
Office Expense	\$18,152 30
Cost of Power purchased from Wasdell and Eugenia	
Systems	6,366 26
Interest on Capital Investment	29,920 27
	<u>\$54,438 83</u>
Surplus applicable to Sinking Fund and Depreciation	
Reserve Accounts	\$40,256 10

EUGENIA SYSTEM

The second generating station which the Commission has constructed was placed in official operation by Sir Adam Beck on November 18th when the municipalities of the Eugenia System received Hydro power for the first time. The service supplied on this system has quite fulfilled the Commission's expectations in every way.

The hydraulic and electrical features of the generating station have been given detailed description in previous reports.

The transmission system now comprises 195 miles of 22,000-volt and 24 miles of 4,000-volt lines. The municipalities now served on this system are Owen Sound, Mount Forest, Durham, Dundalk, Flesherton, Chatsworth, Markdale, Holstein and Chesley.

On June 13th a part of the Pine River System which was acquired by the Commission was connected to the Eugenia System by means of a thirty mile tie line built between Dundalk and Shelburne. The municipalities thus supplied were Orangeville, Shelburne and Horning's Mills. While satisfactory service was delivered since the acquisition of this system, the Commission is taking steps to place it on a par with the operating condition of the balance of the Eugenia System. This will consist of the erection of new sub-stations at Shelburne and Orangeville and complete renovation of the 22,000-volt lines between these points. The future outlook for this portion of the Eugenia System is very bright.

The actual operation and maintenance of the Eugenia System is carried on jointly by co-operation with the municipalities supplied. The success of this scheme was no exception to that enjoyed on the other northern systems.

Below will be found a tabulation showing the date of connection, initial load and load taken in October, 1916, of the municipalities on this system.

Eugenia System

Municipality	Date connected	Initial load in H.P.	Load in H.P. Oct. 1916	Increase in H.P.
Owen Sound.....	November 18th, 1915.	899.5	992.	92.5
Flesherton	" "	29.5	36.2	6.7
Dundalk.....	" "	50.9	50.2	.....
Durham	" "	81.7	63.9	.....
Mt. Forest	" "	156	98.5	.....
Chatsworth.....	December 17th, 1915.	8	25.4	17.4
Markdale.....	November 18th, 1915.	67	60	.....
Holstein	April 3rd, 1916.....	6.8	16.9	10.1
Chesley	June 18th, 1916	87	80.4	.....
Shelburne	" 13th "	45	51.2	6.2
Orangeville.....	" 13th "	60	128.7	68.7
Horning's Mills....	" 13th "	5	5	.....

EUGENIA SYSTEM

OPERATING STATEMENT, FISCAL YEAR 1915-16.

Capital Investment as at October 31st, 1916:

Eugenia Falls Power Development and Generating Plant	\$638,854 14
Eugenia Distributing Stations	51,944 33
Eugenia Transmission Lines	409,355 93
Total Operating Capital	<u>\$1,100,154 40</u>

Revenue as per details below

Owen Sound Power Accounts, December to October..	\$22,536 94	
Flesherton " " " ..	733 13	
Dundalk " " " ..	1,232 32	
Durham " " " ..	1,825 00	
Mount Forest " " " ..	3,226 07	
Chatsworth " January " ..	662 70	
Markdale " March " ..	933 36	
Holstein " May " ..	185 96	
Chesley " July " ..	1,076 01	
Orangeville " " " ..	979 12	
Shelburne " " " ..	500 50	
Hanover " September 16 to October 31	183 12	
Severn System " October 6 to October 31	2,520 13	
Hornings Mills "	70 17	
	<u>36,669 53</u>	

Expenditures

Operators' and Patrolmen's Salaries and Expenses and proportion of Administration and General Office Expenses	\$14,584 03	
Interest on Capital Investment	34,205 94	
	<u>48,789 97</u>	
Deficit on operation		12,120 44

WASDELLS SYSTEM

While the power demand of the municipalities fed from the Wasdells System does not indicate the same growth which characterized the operation of some of the other systems, very satisfactory progress was maintained. A thoroughly reliable and continuous service was provided. The power house, transmission lines, and sub-stations required no extensive repairs and are in first-class operating condition.

The excess capacity available at the power house over what was required for serving the Wasdells System was very conveniently and economically utilized to take care of the increased power demand of the municipalities of the Severn System.

A tie line between the power house and the Orillia substation at Longford, constructed during the summer, made this arrangement possible, and after parallel operation was commenced on July 24th, the Wasdells power house supplied an average load of 750 h.p. continuously throughout the balance of the year without difficulty. Thus the Big Chute generating station was relieved of the greater part of the power demand of the municipality of Orillia, at Orillia and at Longford.

Wasdells System

Municipality	Load in Oct., 1915 H.P.	Load in Oct., 1916 H.P.	Increase in H.P.
Beaverton	54.9	56.3	1.4
Brechin	37.5	36.2	.....
Cannington	46.9	57.6	10.7
Sunderland	20.1	52.2	32.1
Woodville	49.6	48.2	.....

OPERATING STATEMENT, FISCAL YEAR 1915-16.

Capital Investment as at October 31st, 1916:

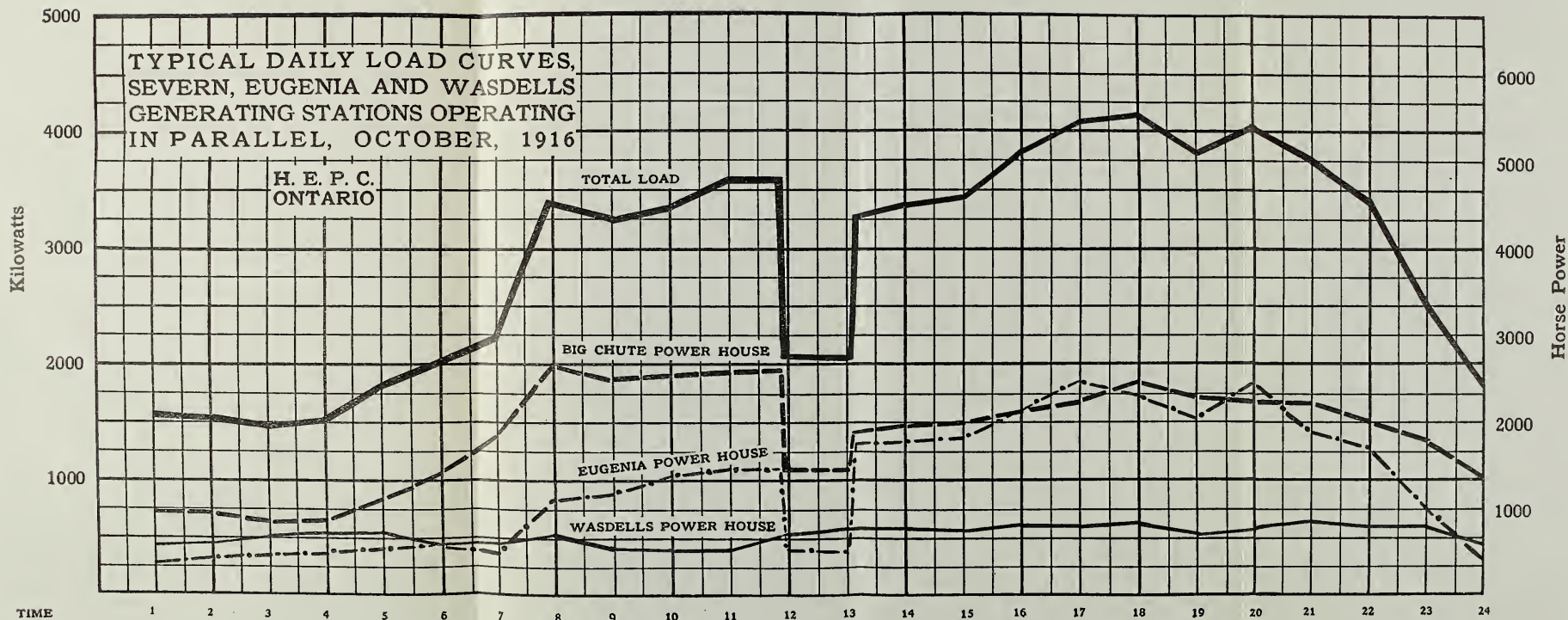
Wasdell Power Development and Generating Plant	\$136,658 47
Wasdell Distributing Stations	13,616 24
Wasdell Transmission Lines	114,406 03
Total Operating Capital	\$264,680 74

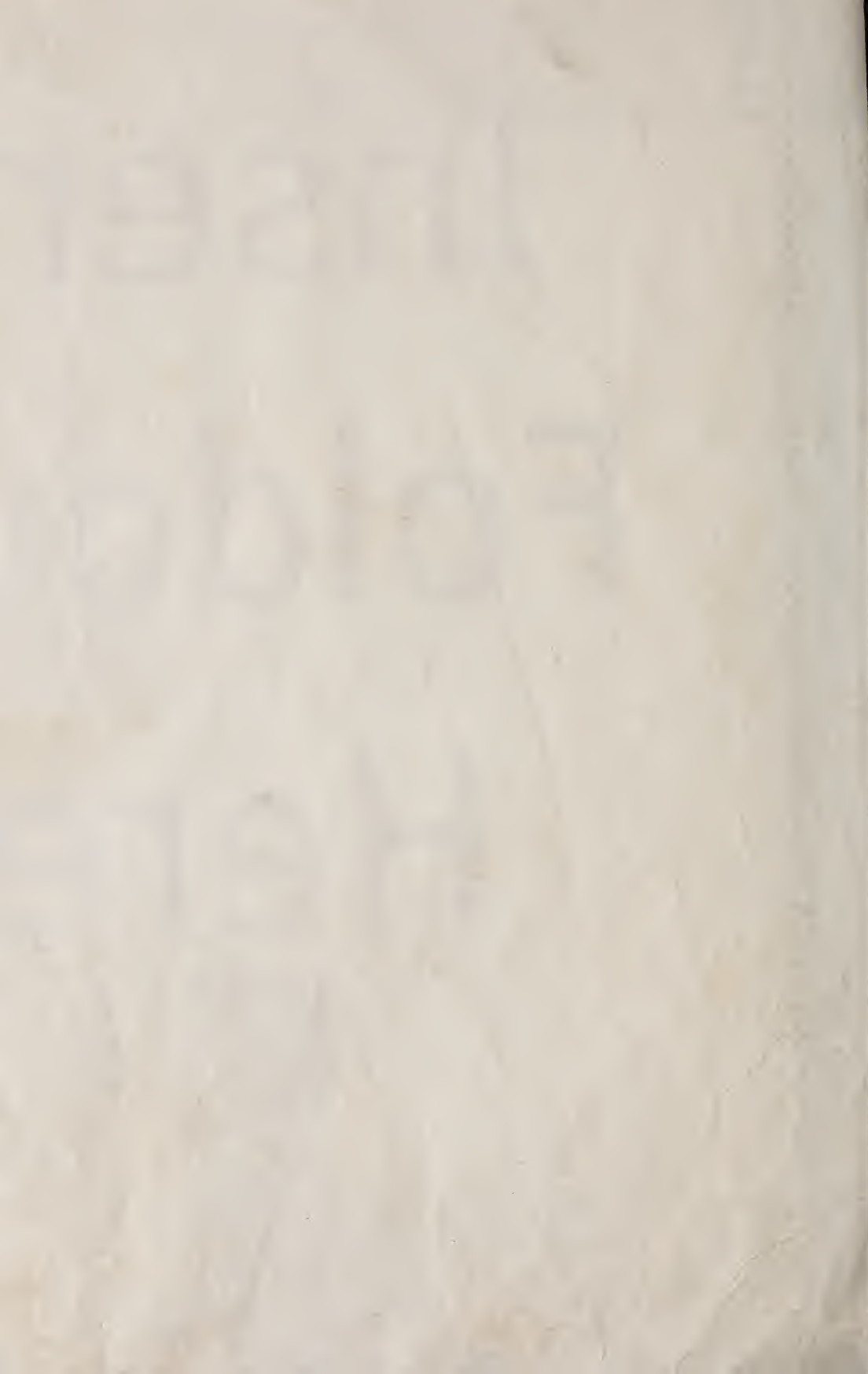
Revenue as per details below

Beaverton Power Accounts	\$3,156 97
Brechin "	2,615 77
Cannington "	3,163 11
Sunderland "	2,018 92
Woodville "	3,354 15
Severn System "	3,846 13
	\$18,155 05

Expenditures

Operators' and Patrolmen's Salaries and Expenses, including supplies	\$3,461 02
Administration and General Office Expenses	1,010 19
Interest on Capital Investment	9,114 66
	13,585 87
Surplus applicable to Sinking Fund and Depreciation Reserve Account	\$4,569 18





PARALLEL OPERATION OF THE SEVERN, EUGENIA AND WASDELLS SYSTEMS

As mentioned above, some action became necessary to relieve the load conditions at the Big Chute generating station caused by the increase of the power demand of the municipalities fed from this plant.

The first step in this direction was the erection of a 22,000-volt tie line of No. 1/0 aluminum, seven miles long, between the Wasdells power house and the sub-station belonging to the Municipality of Orillia at Longford. The balance of the circuit was completed by the existing Orillia 22,000-volt lines via the Orillia transforming and switching stations and the Big Chute plant. To complete telephone communication between the plant arrangements were made with Orillia to erect a telephone circuit on the power line poles between Orillia and Longford.

The two plants were placed in normal parallel operation on July 24th, the Wasdells plant supplying practically all the load previously taken by Orillia from the Big Chute plant in addition to the load taken by the municipalities of the Wasdells System. Thus the primary object was gained of loading the Wasdells plant to a degree of economical operation and reducing the load on the Big Chute plant.

The power supply for the Severn System was further augmented by the paralleling of the Eugenia plant with the Big Chute plant. This was accomplished by the erection of a 22,000-volt tie line of No. 1/0 copper and No. 9 iron telephone circuit, twenty-four miles long, between the Eugenia power house and the Collingwood distribution station. The tie line was built in an incredibly short space of time and power from the Eugenia plant was first supplied to the Severn System on October 6th. Temporary metering equipment was installed at both the Wasdells and the Eugenia plants to measure the interchange of power.

The parallel operation of these systems has been entirely satisfactory, with added security of service to all customers supplied therefrom.

On another page will be found curves showing typical fall operating conditions for twenty-four hours with the three systems in synchronism.

CENTRAL ONTARIO SYSTEM

The operation of the Central Ontario System has been entirely satisfactory since passing into the hands of the Commission. On account of the various points of supply total interruptions to service are almost impossible and have seldom, if ever, occurred. The operation of equipment has been most successful, no failures of any importance having taken place.

The steadily growing load at various points has necessitated some readjustment of equipment. One 750 k.v.a. transformer was moved from Port Hope to Oshawa, bringing the capacity of that point up to 2,250 k.w., and on account of the construction of the Government arsenal at Lindsay it was necessary to interchange two 300 k.w. units at Lindsay for two 750 k.w. units from Cobourg. At other points equipment of less importance has been replaced by apparatus more suitable to existing load conditions than that formerly used.

Practically all equipment which had become obsolete or unfit for service was scrapped and advantage taken of the high prices for scrap metals at present in force. Careful studies of the lines were made and whenever it was profitable the amount of conductor material was reduced to the most economical point. The material recovered in this way enabled almost all extensions necessary to be taken care of without delay and without the purchase of additional conductor.

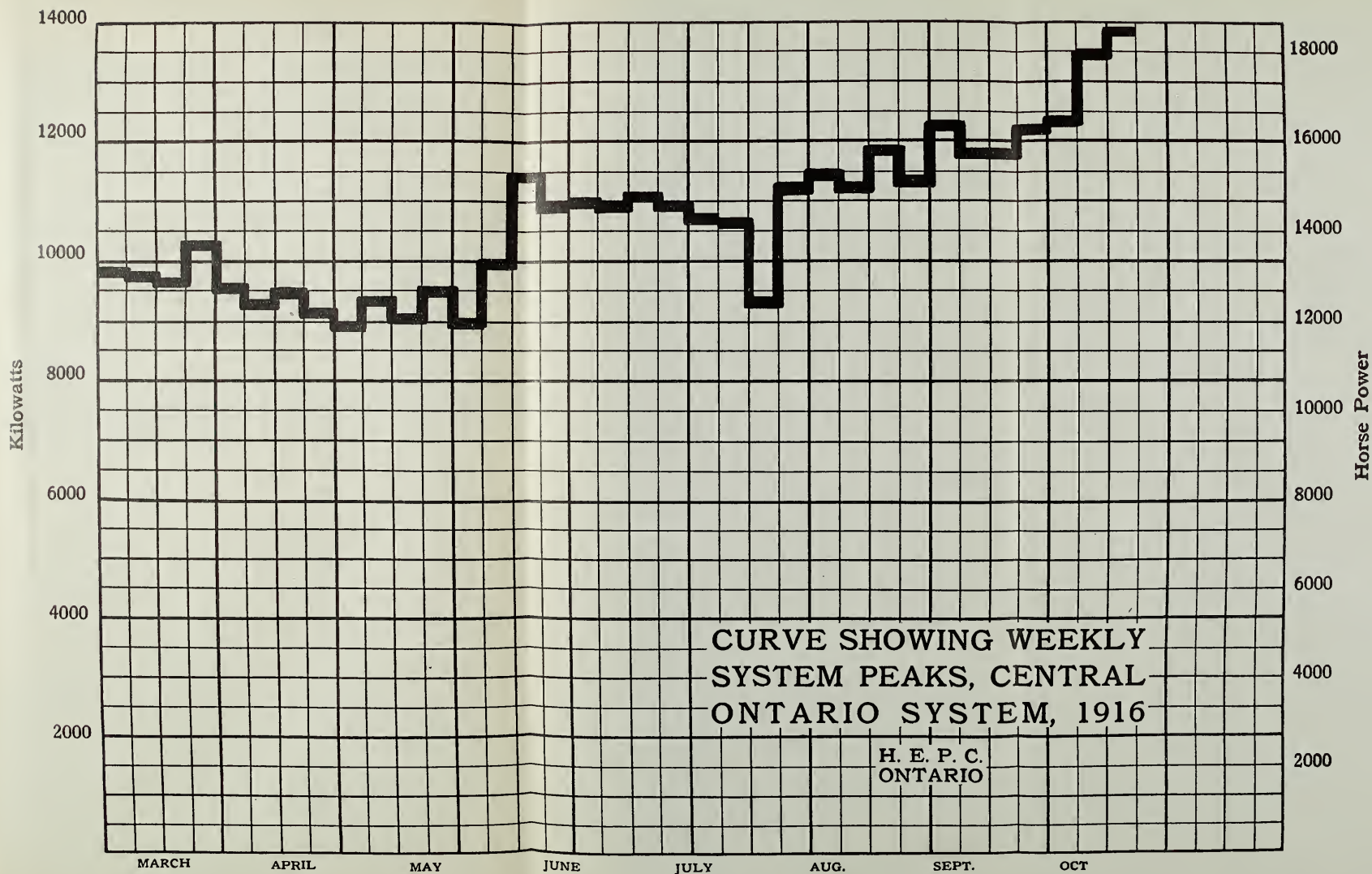
While the growing load will undoubtedly soon overtake the present capacity of generating plants it has been possible to carry all load this year without taxing equipment and with a conservative amount of reserve apparatus available.

Loads at the various towns are shown in the table below and the curve of the weekly peaks shows the growth of load since this property has been under the control of the Commission. Another table shows the total output of the system for the current year and comparison of operation for the year 1915.

Power Generated, Central Ontario System

Month	Peak Load, 1915	Peak Load, 1916	Increase in H.P.
November	15,100	17,800	2700
December	13,400	18,190	4790
January, 1916	13,300	16,150	2850
February	12,560	13,700	1140
March	11,500	13,750	2250
April	11,610	12,640	1030
May	11,100	12,650	1550
June	10,600	15,300	4700
July	11,980	15,600	3020
August	14,570	15,850	1280
September	14,550	16,500	1950
October	16,200	18,600	2400
Peak for year	16,200	18,600	1800

Municipality	Load in H.P. October, 1916
Whitby	217
Bowmanville	1247
Oshawa	1568
Newcastle	20
Orono	20
Port Hope	375
Cobourg	502
Colborne	75
Brighton	72
Trenton	670
Belleville	1434
Napanee	315
Deseronto	302
Stirling	75
Tweed	87
Lindsay	1062
Peterboro	3067
Millbrook	38



CURVE SHOWING WEEKLY
SYSTEM PEAKS, CENTRAL
ONTARIO SYSTEM, 1916

H. E. P. C.
ONTARIO

MUSKOKA SYSTEM

The power development on the south branch of the Muskoka River at Muskoka Village which had been taken over from the Municipality of Gravenhurst was formally under operation by the Commission on November 1st. The purchase comprised the power site which had been partially developed by the municipality and the existing generating station and hydraulic works on the property. On November 1st power was being supplied to Gravenhurst at 6,600 volts and a small amount to Muskoka Village at 120 volts.

The Commission immediately proceeded with the extension and remodelling of the generating station to place it in first-class operating condition and to deliver the power covered by contract with the Municipality of Huntsville. A detailed description of the new hydraulic and electrical equipment of the plant will be found in another section of the report. Every effort was exerted by the Commission to supply uninterrupted service during the alterations to the station.

On August the 15th a 26 mile, 22,000-volt, No. 2 S.R. aluminum line to Huntsville distribution station was made alive for test. The sub-station was placed in operation permanently on August 25th.

All construction details at the power house were not completed at the end of October, which was due to the difficulty in obtaining reasonable delivery of materials.

The peak load demands of the Municipalities of Gravenhurst and Huntsville for the month of October were 235 and 580 h.p. respectively. The Commission will be in a position to supply standard service and anticipates a very successful future for the Muskoka System.

PORT ARTHUR SYSTEM

Steady progress was made in the operation of the Port Arthur System during the past year. The increase in load was taken care of by loading the Current River Hydraulic Plant of the City of Port Arthur to its full capacity. Thus the Commission was not obliged to increase the present reserve demand of 2,600 h.p. from the Kaministiquia Power Company. The Company's power supply to the Commission during the year was of the usual high standard.

The total demand from both sources is approximately 5,100 horse-power at the present with indications of a very material increase in the near future.

The more uniform routine of operation established in 1915 whereby the load control of the Current River station was placed in the hands of the Commission's operators has proved very economical in every respect.

The Hydro transforming sub-station is in excellent condition, and no failures were reported during the year.

Plans and specifications were prepared and material ordered for the erection of a wood pole line entrance and switching structure, at the transformer station to provide a means of sectionalizing the two 22,000 volt outgoing circuits to the grain elevators and to the waterworks station. This work will be carried out in conjunction with the Port Arthur Commission. Five air break switches will be installed on this structure. The Port Arthur Commission is proceeding with the erection of two air break switches on each of the lines built to the elevators and to the waterworks station. When these installations are completed it will be possible to feed any one of the four elevator stations from either of the two outgoing 22,000 volt lines from the sub-station and will greatly increase the flexibility and security of the service on the high tension portion of the system.

Capital Investments for the Port Arthur System to October 31st, 1916:

Transmission Lines	\$21,303 12
Transformer Stations	86,089 91

Total Operating Capital \$107,393 03

The Operating and Maintenance Expenses for the fiscal year ending October 1916, are as follows:—

Operators' Salaries and Expenses, including Operating supplies, and proportion of Administration and General Office Expenses	\$5,721 88	
Interest at 4% per annum ..	4,325 00	
Sinking Fund at 1.8% per annum	1,946 25	
Cost of Power	37,365 00	
		\$49,358 13

A Financial Statement of Operation for the fiscal year ending October 31st, 1916 is given below:—

Sum of monthly loads delivered and value, including charges for Administration, General Expenses, Operation, Interest, Sinking Fund and Depreciation	28,080 h.p.	\$54,322 11
Sum of monthly loads purchased and value, including Administration, General Expense, Operation, Interest and Sinking Fund	28,080 h.p.	49,358 13
Surplus applicable to Depreciation Reserve		\$4,963 98

THE ST. LAWRENCE SYSTEM

The operation of the Commission's system on the St. Lawrence River for the past year proved very successful. The service received from the hydraulic plant at Iroquois was thoroughly reliable and practically no interruptions occurred. A recent inspection of the Commission's sub-stations and lines shows that so far the depreciation of this system is quite negligible.

The total load demand of the municipalities during the year increased to 1,000 h.p., an amount considerably above the capacity of the generating station at Iroquois. This difficulty was temporarily solved by paralleling the municipal auxilliary steam plant at Brockville with the Commission's power supply purchased at Iroquois.

The transpositions in the transmission line between Morrisburg and Prescott are being rearranged to remove the inductive effect which has interfered with the proper operation of the Bell Telephone Company's line paralleling this line. A series of very interesting tests from an engineering standpoint are being made in connection with this work.

Municipality.	Load in Oct., 1915. H.P.	Load in Oct., 1916. H.P.	Increase in H.P.
Brockville	335	348.5	13.5
Prescott	205	217	12
Winchester	60.3	58.9	...
Chesterville	40.2	48.2	8.
Williamsburg	29.5	17.4	...

ST. LAWRENCE SYSTEM OPERATING STATEMENT, FISCAL YEAR 1915-16.

Capital Investments as at October 31st, 1916:

St. Lawrence Distributing Stations	\$23,063 25
St. Lawrence Transmission Lines	147,013 62

Total Operating Capital	\$170,076 87
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Revenue as per details below

Prescott Power Accounts ..	\$4,462 11
Chesterville "	1,838 69
Winchester "	2,321 42
Williamsburg "	563 21
Brockville "	8,340 86
	<hr/>
	17,526 29

Expenditures

Operators' and Patrolmen's Salaries and Expenses	.
proportion of Administration and General Office	
Expense	\$1,559 66
Interest on Capital Investment	6,783 35
Cost of Power purchased	5,513 89
	<hr/>
	13,856 90

Surplus applicable to Sinking Fund and Depreciation	
Reserve Accounts	\$3,669 39

TOTAL CAPITAL INVESTMENT TO OCTOBER 31st, 1916

Following is a statement of expenditures on Capital Account, including Niagara, Severn, St. Lawrence, Wasdell, Eugenia, Muskoka, Port Arthur, Renfrew and Ottawa Systems, Stock on Hand, Tools and Equipment, Municipal Construction.

Niagara System—Transmission Lines

Right-of-Way	\$1,034,920 58	
Steel Tower Lines	3,403,585 05	
Telephone Lines	129,706 69	
Relay System Lines	54,537 32	
Conduit System (Ont. Power Co. to Niagara Station) ..	96,698 64	
		\$4,719,448 28
Right-of-Way (Dundas-Toronto), in course of construction	\$6,366 37	
Steel Tower Lines, in course of construction	8,631 74	
Conduit System, in course of construction	22,157 54	
Telephone Line (Section A), in course of construction ..	1,297 70	
		38,453 35
Wood Pole Lines	\$1,785,208 01	
Wood Pole Lines, in course of construction	189,094 42	
		1,974,302 43
Welland and St. Catharines District Lines	\$16,445 63	
		16,445 63
Rural Line Construction	\$324,168 44	
		324,168 44
Power Development, Right-of-Way and Preliminary Engineering	\$33,512 91	
		33,512 91

Transformer Stations

Stations	\$2,797,209 61	
Stations and Extensions to same, in course of construction	34,415 66	
		2,831,625 27
Distributing Stations	\$221,130 02	
Distributing Stations, in course of construction	10,634 26	
		231,764 28

Severn System

Big Chute Power Development, including-Generating and Transformer Stations	\$349,787 46	
Transmission Lines	335,497 20	
Distributing Stations	78,451 08	
Distributing Stations Extensions in course of construction	1,409 83	
		765,145 57

St. Lawrence System

Transmission Lines	\$147,228 58	
Distributing Stations	23,063 25	
Distributing Stations in course of construction	6,366 07	
		176,657 90

Wasdell System

Power Development, including Generating and Transformer Station	\$136,658 47	
Transmission Lines	114,406 03	
Distributing Stations	13,637 00	
		264,701 50

Eugenia System

Power Development, including Generating and Transformer Station	\$638,854 14	
Transmission Lines	409,355 93	
Distributing Stations	51,944 33	
Distributing Stations in course of construction	1,249 29	
Transmission Lines in course of construction	36,276 66	
Operation	12,120 44	
		1,149,800 79

Muskoka System

South Falls Power Development, including Generating and Transformer Station	\$78,707 61	
Transmission Line	52,626 47	
Distributing Station	8,923 95	
Operation	912 26	
		141,170 29

Port Arthur System

Transmission Lines	\$21,303 12	
Transformer Station	86,089 91	
		107,393 03

Renfrew System

Round Lake Storage Dam	\$20,168 86	
Power Development (repayable)	717 41	
		20,886 27

Ottawa System

Meter Equipment	\$432 39	
		432 39

General Accounts (Chargeable)

Municipal and Rural Construction Work repayable ..	\$290,247 62	
Sales to Municipalities	159,226 01	
Renfrew District Operating Charges	2,519 82	
		451,993 45

General Accounts (Capitalized)

Office Furniture, Equipment, Stationery, Unexpired Insurance, etc.	\$36,531 78	
Office Furniture and Equipment, Electrical Inspection Dept.	3,863 60	
Toronto Storehouse, Testing Laboratory, Garage and Machine Shop	117,883 72	
Dundas Storehouse	1,586 04	
Automobiles and Trucks (Depreciated value)	27,480 29	
Office Building	335,866 60	
		523,212 03

Stock and Tools

Stock on hand for construction purposes and sale to Municipalities	\$163,673 72	
Line Maintenance Stock for all Systems	59,905 07	
Operating Department's Testing and Metering Equipment for all Systems	2,609 76	
		226,188 55
Line and Station Construction Tools and Equipment ..	\$4,000 32	
Line and Station Maintenance Tools	6,666 08	
Hydraulic Construction Tools	1,402 88	
		12,069 28
Laboratory Operation	\$9,482 04	
Machine Shop Operation (Stock)	520 35	
		10,002 39
		<u>\$14,019,374 03</u>

PROVINCIAL EXPENDITURES

Fiscal Year 1915-16

Engineering assistance to non-operating Municipalities for the gathering of data throughout the Province for statistical purposes; reports on Municipal operation	\$19,897 74	
Municipal estimates for power supply non-operating Municipalities and also rates investigations	4,058 45	
Hydrographic surveys, storage surveys, reports and investigations on power sites and stream flow for the Province.....	31,366 77	
Reports and statistical data on overhead and underground construction for Municipalities; investigations relative supply of power to rural districts and gathering information with respect to the use of electricity along lines not at present operated by the use of such	8,625 85	
Engineering investigations, surveys and reports on proposed Municipal Electric Railways	38,675 66	
Administration and general office expense over all above expenditures	28,140 55	
	<u>\$130,765 02</u>	
<i>Less:</i>		
<i>Credits:</i> —Various supplies, equipment and capital expenditures charged Province former years, now capitalized in Commission's books, sold, or placed in stock	38,391 49	\$92,373 53
Electrical Inspection—Balance of operating expenses for the year, not including capital investment, such as furniture, typewriters, etc., which is carried forward		31,345 53
Special Hydrographic Investigations—Lake-of-the-Woods Districts for the Department of Lands and Mines		1,972 02
Equipment on hand purchased for Hydrographic work		1,353 28
		<u>\$127,044 36</u>

BALANCE SHEET

OCTOBER 31st, 1916.

Assets

Sundry Expenditures, per list	\$14,019,374 03
Warrantable Advances	35,118 16
Unpaid Power Bills, October 31st, 1916	375,579 20
Cash on hand	297,140 80
	<hr/>
	\$14,727,212 19

Liabilities

Provincial Treasurer	\$13,588,667 72
Niagara System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	939,814 38
Wasdell System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	4,569 18
Severn System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	57,030 56
St. Lawrence System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	4,345 93
Welland System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	1,449 24
Port Arthur System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	27,151 56
Ottawa, applicable to unpaid Power	1,204 00
Interest Account	54,061 38
Cable Reels	210 85
Central Ontario System Balance	38,536 29
Storehouse Operation, Surplus	6,697 03
Garage Operation, Surplus	533 25
Administrative Office Building, applicable to Sinking Fund	2,940 82
	<hr/>
	\$14,727,212 19

SECTION IV

MUNICIPAL WORK

MUNICIPAL ADVICES

Niagara System

The Hydro-Electric enabling and money by-laws were submitted in:—

Dashwood, Dublin, New Dundee, Forest, Hensall, Rodney, West Lorne, Springfield, St. Jacobs and Zurich.

Estimates of the cost of supplying power to these municipalities have been forwarded by the Commission at their request.

The work of building and remodelling the distribution systems in these municipalities is being arranged for, and contracts with the Commission for power have been forwarded for signature.

At the request of these municipalities arrangements are being made by the Commission to have their engineers supervise the construction and remodelling of distribution systems for these municipalities, and, as soon as the necessary transmission lines and distribution systems are completed, power will be supplied.

Hydro-Electric enabling and money by-laws were submitted in:

Burgessville, Exeter, Harriston, Highgate, Listowell, Milverton, Otterville, Palmerston, Wellesley and Wyoming.

All of these by-laws carried by large majorities, and distribution systems were constructed under the supervision of the Commission's engineers, and power was turned on early in the year. All of these systems are now operating satisfactorily.

Engineering advice was given and rates were forwarded to the following municipalities in connection with proposed extensions to rural customers, outlining the necessary procedure to be followed under which power could be supplied to petitioners in these townships:

Ancaster Township, Barton Township, Biddulph Township, Blandford Township, Blenheim Township, Brantford Township, Burford Township, Chinguacousy Township, Dover Township, East Flamboro' Township, Esquesing Township, Etobicoke Township, Enniskillen Township, Guelph Township, London Township, Raleigh Township, Sandwich East Township, South Dumfries Township, Southeast Hope Township, Thorold Township, Tilbury Township, Tilbury East Township, Toronto Township, Townsend Township, Vaughan Township, Waterloo Township, Wilmot Township, West Nissouri Township, West Oxford Township, Woodhouse Township, Yarmouth Township, York Township, Zone Township.

The auditor's annual report shows that the operation of the systems in Ancaster, Blenheim, Comber, Dresden, Dundas, Ford City, Pt. Dalhousie, Sandwich and Thamesville has been very satisfactory, each of these systems showing a fair margin of profit for the year's operation.

During the year engineering assistance, in connection with extensions to distribution system and the taking on of new power customers, was given to the following municipalities:

Ailsa Craig, Ayr, Baden, Beachville, Brantford, Caledonia, Delaware, Dorchester, Dutton, Elmira, Elora, Embro, Fergus, Goderich, Hagersville, Lambeth, Lucan, Lynden, Mt. Brydges, New Hamburg, Paris, Pt. Stanley, Rockwood, Simcoe, Seaforth, St. George, Tilbury, Walkerville, Watford, Woodstock.

The auditor's report shows that all of these municipalities have operated for

the year with a margin of profit, the number of lighting customers having been materially increased during the year, and the power consumption considerably increased, especially in those towns that are manufacturing large quantities of war munitions.

During the year estimates were forwarded to the following municipalities:

Agincourt, Amherstburg, Atwood, Brigden, Brownsville, Burlington, Chippawa, Crediton, Drayton, Essex, Harrow, Humberstone, Kerrwood, Kingston, Leamington, Moorefield, Pt. Colborne, Scarborough Township.

Acton

During the year the Department assisted in obtaining two large additional power loads which will greatly increase the business done by this municipality. Engineering advice was also given in connection with necessary changes to the distribution to take care of the increased load and of altered conditions in connection with the streets.

Amherstburg

During the year engineering assistance was given to the Municipality of Amherstburg in designing and supervising the remodelling of their street lighting system.

This system is now operating satisfactorily.

Bothwell

The Bothwell system shows a very satisfactory operating report for the year and in December a small oil pumping load was taken on. It is expected that a considerable amount of power will be sold in Bothwell district in the near future for oil pumping purposes.

Brampton

Owing to the marked increase in the power load it became necessary to increase the capacity of the municipal station, and at request of the local Commission assistance was given in the purchase of larger transformers to take care of the increased load. Assistance was also given from time to time in connection with various matters connected with the business.

Burford

The operating report for Burford for the year is very satisfactory and in September a considerable number of customers were taken on the system, owing to the fact that the local companies decided to discontinue service in Burford.

Chatham

The number of "Commercial" and "Domestic" customers in Chatham shows a large increase for the year, and approximately 500 h.p. in motor loads has been connected to the system. The municipality has installed 120 h.p. in pumping motors at the municipal pumping plant.

Clinton

The Light and Power Department of the Utilities Commission reports a very favourable year with some additional lighting load and also extra power load.

When the Hydro was first introduced at Clinton, a privately owned plant had contracts with various customers, which did not expire until 1916. One of these contracts necessitated the operation of the old steam plant at a considerable loss to the Department. This has now been changed over to Hydro power and the system is operating at a much higher point of efficiency.

Dereham Township

A large number of rural petitions were received from the ratepayers in this township in the district between Tillsonburg and Brownsville, and also between Tillsonburg and Springford, and during the year a systematic canvass was made in these districts and sufficient contracts signed at the approved rates to warrant the Commission proceeding with the construction of the necessary lines to supply this power.

Dunnville

In September the Hydro-Electric enabling by-law and a money by-law for \$53,000.00 were voted on by the ratepayers and passed by large majorities.

At the request of the municipality a valuation was made of the local plant and distribution system belonging to the Dunnville Electric Light Company, and negotiations were entered into by the municipality through the Commission which resulted in the purchase of the company's plant by the municipality for \$16,500.00.

A contract with the Commission has been signed at the following rate:

H.P.	Delivered volts.	Cost per H.P. per year.
300	45,700	\$27.77

Galt

The municipality has approved of the Commission supplying power at 12,200 volts, instead of 6,600 volts, as at present, and arrangements will be made by the local Commission during the coming year to install additional transformer equipment to take care of the large increase in load.

Grantham Township

During the year engineering advice was given at various times in connection with extensions to the Grantham Township system. The operation of this system is being handled by the St. Catharines Commission.

Hamilton

A detailed report was prepared by the Commission's engineers at the request of the municipality, in connection with the matter of placing the wires of all crossings in the business district under ground on the main streets.

Arrangements have been made whereby the municipality will pay for and take over the 13,000 volt lines within the limits of the municipality, which lines were originally installed by the Commission to supply the waterworks with power direct.

Hespeler

Owing to the large increase in loads in the various municipalities in this district, after receiving the approval of the municipalities, the Commission has

decided to supply power to Hespeler and other municipalities in this district at 13,200 volts instead of 6,600 volts as at present.

A full report in connection with this change was made by the Commission's engineers and submitted to the municipality.

Ingersoll

The Commission, at the request of the municipality, has given engineering assistance in connection with the installation of an ornamental street lighting system on the Main Street, as well as engineering assistance in connection with other matters regarding the operation of the system.

London

At the request of the municipality the Commission's engineers investigated the matter of interference between the lines of the Public Utilities Commission and the lines of the London Electric Company. A full report in connection with this matter was made and submitted.

London Township

On requests for petitions from the proof line district and that adjacent to Ettrick, arrangements were made and meetings held at which committees were elected to go on with the propaganda work in the districts referred to.

Mitchell

Arrangements are being made by the Commission to supply this municipality with power at 26,400 volts instead of 13,200 volts as formerly, and while this change is being made the municipality is advised to erect a new sub-station building in which this equipment will be installed.

The municipality has decided to discontinue the use of the 60-cycle steam plant, which will mean a considerable saving to the power and lighting users.

New Toronto

Contracts for large amounts of power have been made and assistance given by the Municipal Department in laying out extensions to the local system to serve these loads.

The greatly increased demand will necessitate extensive additions to the transmission line supplying that municipality and will also necessitate the building of a new and much larger transformer station. To meet the immediate demands, arrangements have been made and work commenced on the erection of temporary lines and stations, while engineering has been done on the permanent work.

Niagara Falls

Hydro rates were put into force in the municipality at the first of the year.

In November the municipality's contract with the Ontario Power Company expired and from that date power was supplied by this Commission. The lines connecting the municipal station with the Commission's high tension station, were in the most part purchased from the Ontario Power Co. Arrangements were

also made whereby the municipality purchased the sub-station equipment in the municipal station, which was the property of the Ontario Power Company. A number of estimates were prepared *re* cost of power to several large customers who were considering locating in the neighbourhood of this city.

Niagara-on-the-Lake

At the request of the municipality the Commission's engineers supervised the installation of new electrically operated pumps, as well as a new sub-station building for same.

Norwich

During the year assistance was given to the municipality in connection with the installation of an ornamental street lighting system for the business section of the village. The operation of the system for the year shows a substantial increase in load and a considerable surplus.

North Norwich Township

At the beginning of the year forty-eight rural customers were being supplied with power, and during the year extensions have been made to Burgessville and also an extension to supply a number of farmers south of Newark. The township having signed a standard township contract with the Commission for power, arrangements have been made to extend the township lines south from Newark and west from Burgessville.

Hydro-Electric power for rural purposes in this township has proved a great success, as is shown by the number of farmers who have signed contracts during the year.

South Norwich Township

A large number of petitions have been received from petitioners in the Springfield district in this township, and during the year sufficient contracts were signed at the standard rural rates for the construction of a line running south of Newark, and arrangements are now being made for the construction of extensions to supply the consumers who have signed contracts for power.

Petrolia

The distribution system in Petrolia, which was purchased from the Petrolia Utilities Company, was remodelled under the direction of the Commission's engineers and Hydro-Electric power was first supplied to the municipality in the month of April.

A considerable number of extensions were made to the system during the year, to supply power to various companies for oil-pumping purposes, and there is every indication that practically all of the oil pumping in this district will be done by Hydro-Electric power in the very near future.

A complete street lighting system was put into operation, as well as an ornamental lighting system on the main street, consisting of ornamental cast iron standards of the shepherd's crook type, equipped with 600 c.p. lamps.

Port Arthur

Municipal operations in this city ran smoothly during the year and with little assistance from this office. Late in the year, however, the Commission was waited upon by a deputation composed of the Mayor and several of the Commissioners, who urged that Dog Lake be developed for Port Arthur. Many facts and figures were presented, showing the necessity for providing another source of power supply by the time the present Kam power contract expires in the spring of 1920.

The deputation departed to follow out the suggestion made to them, namely, to submit a written petition to the Commission setting forth the facts in the case. Such a petition will doubtless be received within the coming year.

Preston

At the request of the municipality the Commission's engineers prepared and submitted a complete report in connection with the waterworks situation in the municipality.

Engineering assistance and advice were also given in connection with various matters relating to the operation of the system.

Ridgetown

Arrangements were made whereby the municipality installed electric-driven pumps to operate some new wells in connection with its municipal pumping plant. These pumps were put into operation in November, 1916.

Sarnia

The Hydro enabling by-law and also a money by-law were passed by large majority at the municipal elections.

The enabling by-law was for an amount of \$120,000, which is the amount necessary to cover the first payment for the plant purchased from the Sarnia Gas and Electric Light Co., and also take care of the cost of remodelling that system. The plant purchased is being remodelled under the direction of the Commission's engineers and a complete street lighting system is being installed. Ornamental lamps are being installed on the main streets. A combination steel trolley pole and ornamental brackets being used. Lamps in the main street will be 20 ampere lamps of 1,000 candle power capacity. It is expected that the full amount of power contracted for will be required within the first year's operation of the system.

Scarboro Township

Acting on petitions received from the township, an investigation was made as to the possibility of supplying residents in the south-western portion of the township with an electric lighting and power service, and estimates, together with rates for such service, were submitted. A number of public meetings were held and the Council appointed representatives to canvass the districts in question. As a result of this canvass some 215 contracts were secured.

At the end of the fiscal year the Township Council was preparing to enter into an agreement with the Commission for the building of lines and the supply of electric power.

St. Catharines

Arrangements were made whereby the Ontario Power Company has agreed to supply additional power to the municipality for a period of three years. Power to be supplied from the Ontario Power Company's transformer lines in the St. Catharines district.

Approximately 1,000 customers have been added to the system during the year and arrangements have been made to supply power to a number of very important munition plants.

St. Mary's

The revision of the street lighting system and also the power plant, which were under way last year, have been completed.

New power customers have been obtained and the operation during the year has been quite satisfactory.

St. Thomas

Owing to the large increase in loads on the system the municipality requested the Commission to prepare and submit specifications and drawings to the local commission for a new sub-station building, and additional equipment to be installed therein.

At the request of the municipality the Commission's engineers supervised the erection of this building and the installation of the electrical equipment.

Stamford Township

At the request of the Township of Stamford the Commission negotiated with the Ontario Distributing Company and purchased for the municipality the Company's lines, plant and system in the township outside of the limits of the City of Niagara Falls for the sum of \$29,500.00, and the township submitted to the rate-payers the Hydro-Electric enabling by-law and a money by-law for an amount to cover the purchase of this system.

The Commission is at present operating this system for the township until such time as legislation has been passed whereby the township can sell debentures and operate this system; after which time the plant will be turned over to the township and the Commission reimbursed for the purchase amount.

Stratford

The load at Stratford station has increased to such an extent that it was decided to erect a new sub-station and contracts for the station and equipment have been let. The station when complete will be one of the most modern on our system and will have a capacity for a nominal load of 3,000 h.p.

In the Water Works Department the year's business shows the completion of the revisions which were being carried out in the pumping plant and also the completion of the new water tower. These additions are working out very satisfactorily to the city.

The installation of gasoline driven pumps in place of steam as auxiliary to Hydro pumping shows a net saving of over \$3,000 per year.

Strathroy

During the year the local Hydro-Electric System and the waterworks system were placed under the management of a Utilities Commission, and the old steam pumps have been replaced with electrically operated centrifugal pumps for the domestic water supply, and a gasoline engine operated unit has been installed as a stand-by for fire purposes.

Tavistock

During the year the Commission's engineers looked over the incorporated village's requirements for a distribution system and estimates were prepared showing the cost and submitted to the council. Estimates showing the cost of 4,000-volt power were also submitted and a contract was signed with this Commission for 50 h.p.

At the municipality's request the Commission's engineers supervised the installation of the system, all labour being employed locally.

A small automatic domestic pump, driven by a single-phase motor, was installed in the waterworks station to handle the pumping electrically.

The local system was put into operation October the 26th.

Tillsonburg

During the year the municipality authorized the Commission to change its distribution system from 2,200 volts to 4,000 volts operation, in order that the surrounding rural districts might be supplied more advantageously at this voltage.

Engineering assistance was also given by the Commission in connection with various matters regarding the operation of the system.

Toronto

During the year negotiations have been in progress in connection with the purchase of the lines and system of the Interurban Power Company lying east of the Humber, and it is expected that negotiations for the purchase of these lines will be completed early in the coming year.

The auditor's report shows that in spite of the large cut in rates at the beginning of the year the system shows a good margin of profit for the year's operation, and the large increase in the number of power and lighting customers shows that the ratepayers in Toronto appreciate and patronize their own utility.

Toronto Township

During the year a number of extensions were made to the distribution system to serve additional customers, while sufficient new customers came on the existing lines to warrant a cut of 25 per cent. in the service charge.

Wallaceburg

During the year electrically operated pumps were installed and put into operation in the new waterworks station, and also small sewage pumps to take care of the necessary sewage pumping in the municipality.

The auditor's report for the year shows a substantial surplus for the year, and a number of large important power customers have been added to the system.

Waterloo

The auditor's report for the year 1916 shows that the Waterloo Hydro-Electric System is operating very successfully from a financial standpoint, and arrangements are being made to have this municipality supply power to a rural line extending north from the limits of the municipality in Waterloo Township.

Waterloo Township

Various petitions have been received from farmers in the township for a supply of Hydro power and an extension from the Waterloo system is being constructed on King St. North and the Lexington Road, to supply some twelve farmers who have signed contracts with the township.

Watford

The Hydro-Electric enabling by-law and a money by-law for \$10,000.00 were submitted to the ratepayers in August and passed by large majorities, and a contract was signed with the Commission for power at the following rate:

H.P.	Delivered volts.	Cost per H.P. per year.
100	4,000	\$59 45

Arrangements have been made to purchase the local distribution system for \$2,500.00, and the municipality has requested the Commission to superintend the remodelling of this system to make it suitable for the distribution of Hydro-Electric power.

Welland

Arrangements were made to construct a new sub-station in the municipality according to plans prepared by the Commission's engineers. This station will be made so that power will be supplied at 2,200 or 13,200 volts, and station will have an ultimate capacity of approximately 10,000 h.p. The load on the Welland station has increased from 1,200 to approximately 2,100 h.p. during the year. Several very large munition plants are supplied from the Welland system.

A number of estimates were prepared by the Commission's engineers *re* cost of power to large power customers who proposed locating in the Welland district.

Weston

Assistance was given the local Commission in various matters, particularly in securing a large power contract, while engineering advice was given in laying out and erecting the necessary additions to the system to provide for this load.

Windsor

During the year an extension was made to the system to supply the Municipality of Ojibway, where a large steel plant is being constructed. It is expected that considerable power load will be obtained in Ojibway in the near future.

York Township

Many applications for electric lighting and power services were received during the year and estimates made on the costs of supplying these applications, while numerous extensions and additions were made to the distribution system.

In order to place the business on a better basis and to relieve the Toronto Hydro System from a portion of the responsibility of supplying such service in the township, an effort was made to have the township enter into an agreement with the Commission for the necessary supply of power and the financing of transmission lines. This proved unsuccessful and as a result a number of applicants have been unable to secure the service.

EUGENIA AND SEVERN SYSTEMS,

Distribution systems, inclusive of street lighting, were designed, constructed and extended during the year in the following municipalities, under the supervision of the engineers of the Department, and Hydro service given for the first time to such systems from the transmission lines of the Commission:

Chatsworth, Chesley, Grand Valley, Holstein, Markdale, Orangeville, Shelburne.

Distribution systems, construction work on which was begun during the latter part of 1915, were completed and placed in operation and given Hydro power for the first time in the following municipalities:

Dundalk, Durham, Flesherton, Mount Forest.

Valuations were made under the supervision of and by the engineers of the Department of privately owned electric light and power plants, distribution systems and transmission lines at the request of various municipalities.

Valuations were made with the idea of purchasing the privately owned properties for the purpose of incorporating same into the local Hydro-Electric Systems. These valuations were supplemented with estimates showing cost of power to the municipalities concerned, and also by special investigations for each locality in connection with load conditions.

Alton: A valuation of distribution system.

Grand Valley and Arthur: A valuation of steam generating plant, distribution systems and transmission lines connecting the municipalities.

Chesley, Hanover, Meaford, Markdale, Port Elgin, and Southampton: A valuation of hydraulic generating plants, transmission lines and distribution systems.

Assistance was given by engineers of the Department in the nature of addressing public meetings prior to voting on money and enabling by-laws in the following municipalities:

Arthur, Chesley, Grand Valley, Holstein, Markdale, Tara.

Estimates covering the cost of power and cost of installation of Hydro service were made and submitted to the following municipalities:

Alliston, Alton, Arthur, Beeton, Caledon, Erin, Horning's Mills, Hepworth, Grand Valley, Kincardine, Lucknow, Meaford, Paisley, Port Elgin, Priceville, Southampton, Tottenham, Teeswater, Tara, Wingham, Wiarton.

Petitions were received and estimates made up and submitted, covering the cost of power to various townships. Investigations were made as to load possibilities, public meetings were held, the Township Councils addressed by engineers of the Department and local committees appointed and rates submitted to these various townships as follows:

Artemesia Township, Amabel Township, Brant Township, Bentinck Township, Derby Township, Essa Township, Euphrasia Township, Floss Township, Nottawasaga Township, Proton Township, Sunnidale Township, Tiny Township, Tay Township, Vespra Township.

Investigations were made and information and engineering advice given *re* the installation of electric motor driven pumps for the purpose of operating waterworks systems in various municipalities. Estimates were made up and submitted covering the cost of operation and installation of such equipment in the following municipalities:

Barrie, Collingwood, Chesley, Mount Forest, Shelburne.

Installations of electric driven pumps were made and completed in the Towns of Collingwood and Mount Forest, and the installations in the other municipalities will be installed and completed early in the new year.

Engineering assistance and advice was given to the following municipalities, in the nature of rate application, soliciting of power loads and new consumers, and other matters pertaining to the management and general operation of the utility, and an engineer of the Department visited each town and village from time to time for such purposes:

Severn System—

Barrie, Collingwood, Coldwater, Creemore, Elmvale, Midland, Penetang, Pt. McNichol, Stayner, Victoria Harbor, Waubaushene.

Eugenia System—

Chatsworth, Chesley, Durham, Flesherton, Holstein, Markdale, Mount Forest, Orangeville, Owen Sound, Shelburne.

Notes on engineering assistance rendered other municipalities are given in the following:

Alton

During the year investigations were made and estimates prepared and submitted covering the delivery of power to the Village of Alton and adjacent villages in the district.

Estimates were also prepared covering the construction of a transmission line from Orangeville to Alton, to supply the Alton Foundry Company with power for the purpose of manufacturing munitions. An agreement was made with the Company, the line constructed and power delivered for the purposes mentioned above.

The Village is making preparations for submitting enabling and money by-laws to the ratepayers early in the new year, with the intention of taking over the transmission line and the Alton Foundry Company's load.

Artemesia Township

An agreement was made between the Township Council and the Commission covering Hydro service for farms and for the rural communities of Eugenia and

Ceylon. Power was delivered to a large stock farm near Markdale under this agreement and from requests already received and investigations made the indications are that a large and important rural load will develop in the township and the surrounding district.

Camp Borden

Advice and information was given to the Department of Militia and Defence in connection with Hydro service for lighting, power, and waterworks systems at Camp Borden.

An agreement was drawn up and submitted for supplying this power.

A transmission line was constructed from a point near the Town of Barrie to the Camp site.

A sub-station building and waterworks pumping plant were also designed and constructed for the Department of Militia and Defence, and power delivered for the operation of the Camp System in the month of June.

East Luther Township

Estimates were prepared and submitted covering the delivery of from 1,000 to 2,000 h.p. to a point in the township near the Village of Grand Valley, for the purpose of manufacturing peat, large deposits of which exist in paying quantities in that locality.

The industrial growth in this district will be greatly stimulated by the use of Hydro power in such an industry.

Hanover

Valuations were made, at the request of the municipality, of the Hanover Electric Light Company's property, including the distribution system within the limits of the municipality and the transmission lines to the hamlets of Carlsruhe and Neustadt, and the generating plant at Maple Hill.

The municipality was given advice and assistance by engineers of the Department in the purchase negotiations for this property, prior to voting on a money by-law to provide debentures for such purpose.

Estimates were made up and submitted to the municipality covering the cost of rebuilding the distribution system, which it was proposed to purchase from the private company, and also covering the construction of an entirely new and separate system.

Estimates were made up covering the cost of supplying a large flour and milling company's property with power, independent of the municipality. An agreement was made between this company and the Commission, the transmission line and sub-station constructed and power delivered during the month of October. This line, station and contract will be taken over by the municipality as soon as the service can be given to same after by-laws have been submitted to the rate-payers for approval.

Owen Sound

Very creditable results from a financial standpoint were made by the operation of the Hydro utility in this municipality during the year, so much so in fact that during the first six months of operation it was found possible to make a reduction of 10 per cent. in rates charged to the consumers for lighting and power service.

The new sub-station building and office building were completed and placed in service during the year.

Orillia

Negotiations were carried on between the municipality and the Commission, covering the sale of power from the Orillia-Swift Rapids Development, for use on the Commission's Severn system, and also covering the interchange of electric power and energy between the Commission's development at Big Chute, Eugenia Falls and Wasdell's Falls and the Orillia system.

A short term agreement was also entered into between the Water and Light Commission of the Town of Orillia and the Hydro-Electric Power Commission of Ontario, covering the purchase by the town of 2,000 h.p. required for the use of munition plants in the municipality prior to the completion of the Swift Rapids Development. This agreement also provided for the joint use of transmission lines by both parties.

Port McNichol

An agreement was made between the Canadian Pacific Railway Company and the Commission covering the supply of power for the operation of the Company's terminal and grain elevator at Port McNichol, and power was delivered under the agreement during the latter part of the month of July.

The transmission line was constructed and sub-station equipment installed in the Company's power house to take care of this load.

At the present time the Company's peak load exceeds 1,000 h.p. and preparations are already being made for installing new equipment to take care of increased loads during the coming year.

Eugenia System—

This system was placed in operation for the first time during the year, power for which being supplied from the Eugenia Falls hydraulic development.

Power was first delivered to 5 municipalities when the development was placed in service on November 1st. Since that date service has been given to 6 additional towns and villages, making a total of 11 municipalities connected to the system at the close of the fiscal year on October 31, 1916.

By-laws were submitted to the ratepayers and carried in four additional municipalities and construction of distribution systems begun and were in progress at the close of the year.

Assistance was also given to two municipalities, which will submit enabling and money by-laws during the early part of the coming year.

The loads and revenue in the municipalities connected to the system during the year have greatly increased since connection to the system and the first delivery of Hydro power, and the development at Eugenia Falls has been delivering its surplus capacity to the adjacent towns in Simcoe County and the Severn system.

Plans are now progressing for an extension to the Eugenia plant to take care of these growing loads.

The negotiations begun during the year 1915, covering the purchase of the transmission system, sub-stations and distribution systems of the Pine River Light and Power Company, were completed and this Company's properties taken over by the Commission and merged into the Eugenia system on May 1st, the following properties comprising this transaction being taken over:

Orangeville distribution system and auxiliary steam plant by the municipality. Shelburne distribution system by the municipality.

Twenty-five miles of 22,000-volt, single-circuit transmission line from Horning's Mills power house at Orangeville by the Commission.

Horning's Mills distribution system and sub-station buildings and equipment at Shelburne and Orangeville by the Commission.

The transformers, lightning arresters and other transmission equipment at the development by the Commission.

Severn System—

A remarkable growth in the load and revenue produced from same has been made by the Severn system during the past year.

The capacity of the Big Chute development serving the district was reached during the month of July, and connections were made to both the Wasdell's Falls and Eugenia Falls developments, in order that the demands for power in the Severn district might be taken care of satisfactorily. Practically all of the surplus power available in both of the latter generating plants is now needed to satisfy the power requirements of the district, and plans are being prepared for increasing the capacity of the Big Chute and Eugenia Falls plants, and also for new developments to take care of the increased and growing loads in the district.

ST. LAWRENCE, EASTERN, WASDELLS, MUSKOKA, NORTH BAY AND PARRY SOUND SYSTEMS

Numerous requests were received for a representative to investigate the requirements of a Hydro-Electric System and, in such cases, an engineer visited the municipalities and obtained the necessary information. Estimates, showing the figure at which power could be supplied to the municipalities, were forwarded by the Commission. A number of valuations and investigations, in connection with utilities have also been made for municipalities.

Engineering assistance has also been given to a great many of the operating towns, on matters pertaining to rate application, economical operation of their local systems, and increasing the light and power business.

During the year, work of the foregoing nature was taken care of by the department in the following municipalities:—Alexander, Arnprior, Aultsville, Bath, Billings Bridge, Brechin, Brock Tp., Carleton Place, Carp, Casselman, Cedarhurst, Dysart, Emily Tp., Ernestown, Faraar Point, Harrowsmith, Kinbourne, Kinmount, Lanark, Lyn, Rear Leeds and Lansdowne, Manotick, Maple Grove, Mattawa, Monck Tp., Moscow, Newboro, Nipissing, North Gower, Perth, Powassan, Richmond, Roblins Mills, South Crosby, Sturgeon Point, Sydenham, Westport, Winchester Springs, Woodville.

Notes on engineering assistance rendered other municipalities are given in the reports following:

Almonte

Work on the remodelling of the municipal power plant and distribution system was begun in July, 1916. An addition was made to the power station, to accommodate a 250 K.V.A., 2,200-volt, generator and belted-exciter, and the

existing penstocks, turbines, etc., were thoroughly overhauled and altered. The water wheel units were re-set, the main shaft extended, and the whole arrangement strengthened by special castings and braces.

The distribution system, which before had been direct-current, was remodelled for 2,200-volt, three-phase distribution, and an efficient system of series street lighting is being installed. The current from the new unit was turned on on October 14th.

Aultsville

Requests were received for estimates on a supply of power to Aultsville, Faraar Point, and the surrounding rural district. The municipality was advised that when the St. Lawrence system was extended as far as this district, it might be feasible to supply them with power.

Beaverton

The distributing station was repaired and put into first-class operating condition, and a set of 22,000-volt lightning arresters installed. Negotiations are under way for a supply of power to be delivered to the surrounding farming district.

Bracebridge

On request from the town officials, estimates were prepared on the cost of power to be delivered to the municipality from the Commission's South Falls plant. It is expected that the municipality will be in a position for further negotiations in the near future.

Township of Brock

Arrangements are being completed for a supply of power to the farms in the townships,—same to be distributed from the substation at Gamebridge.

Brockville

Requisitions have been received from several rural communities, for a supply of light and power, and some of these are being served by the municipality. Negotiations are at present under way for a further supply of power to the St. Lawrence system, and it is expected that load conditions in Brockville will shortly be much improved.

Cannington

The laying of the substation floor was completed, and the interior of the station painted. A set of electrolytic lightning arresters was installed, to replace the former multigap arresters. Negotiations are in progress leading to the supply of light and power to farmers in the surrounding district.

Cobden

At the request of the municipality, estimates were submitted on the cost of building and equipping a local Hydro-Electric plant and distributing system. The money by-law was submitted to the people and passed on January 1, and work was commenced early in May. An efficient storage system was supplied by constructing a conservation dam some distance above the site of the power house. The old regulating dam at the power house site was repaired and new head works, pen-

stock and power house built,—the power house having adjoined to it a dwelling house for the operator.

The power was first turned on on November 24th. The plant is operating very satisfactorily with a load of about 65 K.W. This development enjoys the distinction of being the smallest isolated development yet built by the Commission.

A 135 h.p. Boving re-action turbine is direct-connected to a Canadian General Electric Company 100 K.V.A., 2,300-volt generator. A flywheel was supplied to improve regulation on the outgoing lines.

Cornwall

Exhaustive reports and estimates on the cost of a satisfactory supply of power to the town have been under consideration. Several requests have been received from residents and manufacturers for a supply of power to the town and surrounding district. Investigations are at present under way, with a view to supplying this district from the Commission's St. Lawrence system, in the near future.

Gamebridge

Following the request from residents of this hamlet, estimates were prepared and submitted on the cost of the supply of light and power. Individual contracts were obtained from several residents. The distribution system will be built in the near future, as soon as the requisite by-laws are executed by the township officials.

Gravenhurst

The Commission has acquired from Gravenhurst all rights and titles to that town's generating system at South Falls on the South Branch of the Muskoka River, and also has made a contract with Gravenhurst for a supply of power therefrom. The South Falls power house was remodelled and enlarged to serve Gravenhurst and Huntsville—the former, at 6,600 volts; the latter, at 22,000 volts. The plant was taken over and first operated by the Commission on November 1, 1915—the 6,600-volt transmission line to Gravenhurst being owned and maintained by the municipality.

In August, the accounts of the Corporation were revised to conform with the standards of the Commission.

Booster transformers have been installed on the municipality's incoming lines, to improve the regulation of the distribution system throughout the town.

Huntsville

Following the requests of the town officials, estimates were submitted on the cost of a supply of power to the municipality, and also on the cost of remodelling the distribution system, which, formerly, had been single-phase. In March, an agreement was executed for the supply of 800 h.p. from the Commission's plant at South Falls. Work on the transmission line was begun early in the Spring, and this was carried on concurrently with the erection of a brick substation, and the renovation of the town distribution system. An up-to-date system of series street lighting was also installed. Power was first delivered on August 24, 1916, being carried over the line from the Commission's South Falls plant, at a pressure of 22,000 volts and stepped down to 2,200 volts at the new town substation, for distribution.

Iroquois

Requests were received from the village Council for estimates on the cost of a supply of power to the municipality. After investigation, they were advised that it would be more feasible for them to remodel and operate their present plant, and this work has been undertaken by the municipality.

Kemptville

Estimates on the cost of supplying power to the Corporation of Kemptville, from a source of supply in Merrickville, were prepared and submitted, and a comprehensive survey made of the requirements in the village and surrounding district.

Kingston

In January, the Utilities Commission of Kingston sent in a request for estimates on the cost of power to the city. These were prepared and submitted, based on a supply of 1,500 h.p. On June 19th, in order that the urgency of the situation might be met, the ratepayers voted to ratify an agreement for a limited supply of power to be brought in over an existing pole-line from Kingston Mills. On December 2nd, a contract for the supply of 1,200 h.p., to be delivered from the Commission's Ontario System, at a price of \$28 per h.p., was ratified by the local Commission, and later passed by the Council. The transmission lines for the supply of this power are now in course of erection.

During the year, the Municipal Accounting System of the city was, by request of the Utilities Commission, revised to conform with the standards of the Commission.

Merrickville

Early in the year, the Commission was requested for information as to the advisability of entering into a contract with the Rideau Power Company, for a supply of power to the municipality. After investigation, the village Council was advised against this action, as at that time proposed. A by-law was, however, passed, on submission to the ratepayers, and the village is now being supplied from the Rideau Power Company's generating station.

A study of the water conditions on the Rideau River, is at present being made by the Commission's engineers, with a view to using power from this river for a comprehensive distribution system to supply the surrounding district.

Mille Roches

An industrial survey was made in the village, to ascertain the probable requirements of power and light for residents in the village and outlying district.

Morrisburg

Negotiations have been under way during the year, with a view to leasing the municipal generating plant, for use in supplying power to the St. Lawrence system. Detailed reports have been made, with a view to ascertaining the cost of the necessary repairs before the plant could be connected with the system.

North Bay

The Nipissing Power Company, which supplies power to North Bay, was, in March, 1916, taken over by the Ontario Government and handed over to the Commission for operation in trust. This system is supplied from a generating station on the South River, near Nipissing Village. The power plant is equipped with two (2) three-phase, 450 K.W., direct-connected 2,200-volt units, with direct-connected exciters. The voltage is stepped up at the generating station to a pressure of 22,000 volts, and transmitted at this voltage to North Bay, Callander and Powassan, where it is, in each case, stepped down to 2,200 volts for distribution throughout the respective municipalities. In addition to the above, a 2,200 volt single-phase transmission line supplies light and power to the village of Nipissing.

Estimates were prepared and submitted on the cost of installing a duplicate feeder to supply power to the Trout Lake pumping station for North Bay Water-works Department.

Omemece

Following requests received from the village-officials, estimates were submitted on the cost of a supply of power to be supplied from the Central Ontario System. An enabling by-law was presented to the people on January 1, 1917, and passed by a large majority. The proposed scheme includes the purchase and utilization of the present distributing system. An up-to-date series street lighting system will be installed. The distribution will be at a pressure of 4,000 volts, which provides for the extension of the lines into the surrounding rural districts without further transformation.

Ottawa

In February, the City Commission executed a contract with the Ottawa & Hull Power & Manufacturing Company, for a temporary supply of 750 h.p. Investigations are now being undertaken to ascertain the cost of developing 4,000 additional horse-power capacity, at the Queen street station, to generate power for the proposed pumping plant at Lemieux Island.

Parry Sound

On request from the town officials, estimates were prepared on the cost of a supply of power to the municipality to be transmitted from Chaudiere Falls on the French River. Requests were also received for estimates on the cost of further developing the present town plant and conservation system, and for the supply of power to the Canadian Explosives Company, located at Noebel. Negotiations with this in view are at present under way.

Engineering assistance has also been given to this municipality, in regard to the failure of certain apparatus.

Prescott

Exhaustive investigations have been made, to ascertain the probable future requirements of light and power for the town.

Renfrew

In November, 1915, the local Commission entered into a contract with the O'Brien Munitions Company, whereby they agreed to deliver to the Munitions Company a supply of 900 h.p. This, added to the existing load, made it

imperative that a further supply of power be secured. A timber dam was constructed at Golden Lake, on the Bonnechere River, for conservation purposes, which, owing to the excessively high water in the Spring of 1916, had to be partly blown out. The Commission was approached *re* a further supply of power and, after investigating conditions, proposed an addition to the present plant, by adding a new turbine and generator. This the local Commission decided not to do, and asked for estimates on the cost of a separate supply of power. Accordingly, estimates were prepared on a supply to be transmitted from either the first and fourth chutes on the Bonnechere River and, after consideration of the same, the scheme of developing the first chute was recommended. As a temporary source of supply, a second-hand generator was procured by the Commission and belted to the standby steam engine in the municipal generating station. The by-law to enable the town to raise debentures of the first chute development was defeated on September 2nd, by a small majority. In November, the town Council, with the approval of the Commission, purchased the holdings of the Renfrew Electric Company,—the same comprising a distribution system supplying light and power throughout the town.

Smith's Falls

Estimates are at present being completed with a view to procuring a satisfactory system to supply Smith's Falls and surrounding district with light and power. Exhaustive surveys were made in the town and district, to ascertain industrial conditions and probable present and future loads.

Sunderland

The township of Brock is arranging for a supply of power to be distributed from the substation at Sunderland.

Wasdell's System

The No. 1/0 aluminium wire at present supplying this system is being removed and steel wire installed in its place, thereby affecting a very appreciable decrease in the cost of power to municipalities connected with the system.

Washago

Negotiations have been carried on throughout the year for a supply of light and power to the village. After industrial surveys were made and estimates prepared, it was decided that the load is as yet too small to warrant the building of a necessary transmission line distribution system.

Winchester

Repairs and improvements have been completed in connection with the Winchester substation. A satisfactory increase in power load has been procured for this section of the St. Lawrence system by the addition of the new condensed milk plant in the village of Chesterville.

CENTRAL ONTARIO SYSTEM

The generating stations, transmission lines and distributing systems formerly controlled and operated by the Electric Power Company, Limited, and its subsidiary companies are comprised in the system now known as the "Central Ontario System." The territory served extends from Whitby to Napanee on the south and from Lindsay to Sulphide on the north.

All the holdings of the Electric Power Company were purchased by the Province of Ontario, as of March 1st, 1916; the purchase being confirmed by Act of Legislature, known as the Central Ontario Power Act, which is reproduced in its entirety on page 89.

As provided in the Act, the system was operated for several months by the staff of the Electric Power Company, as agents for the Province. By Order-in-Council, dated May 5th, 1916, the Hydro-Electric Power Commission of Ontario was charged with the operation of the property, and this obligation was assumed by the Commission on June 1st, 1916.

The electrical system is briefly described in the following pages, and in addition to this the property purchased by the Province, and now administered by the Commission, includes a number of gas plants and waterworks systems, and one electric railway, all of which will receive further mention on succeeding pages.

Generating Stations

Power is obtained from six generating stations on the Trent river, which are operated by the Commission, and which have the capacities indicated in the accompanying table. In most cases the concrete dams constructed by the Department of Railways and Canals in connection with the Trent Valley Canal are utilized for the power developments, and future developments to be made on the river will also utilize other similar dams located at various points between Trenton and Fenelon Falls.

In addition to the generating stations operated by the Commission, further supplies of power are obtained from the generating station of the Corporation of the Town of Campbellford at Dam No. 12, to the extent of 1,250 K.W., and from the Peterborough Hydraulic Power Company, from whose station at Dam No. 17, 1,120 K. W. is obtained.

DEVELOPED AND UNDEVELOPED WATER POWERS ON TRENT RIVER

Power Site		Present developed normal capacity kilowatts	Total normal power which can be developed kilowatts
Dam No. 1	Trenton .....	.....	2,500
" No. 2	Trenton	3,000	3,000
" No. 3 }	Combined.....	.....	4,200
" No. 4 }			
" No. 5	Frankford.....	2,600	2,600
" No. 8	Meyersburg .....	.....	4,800
" No. 9	Meyersburg .....	.....	3,200
" No. 10	Ranney's Falls .....	.....	6,100
" No. 11	Campbellford	3,000	3,000
" No. 14	Healey's Falls	6,000	9,000
" No. 18	Peterborough	1,500	1,500
" No. 21 }	Combined .....	.....	2,000
" No. 22 }			
" No. 27	Burleigh Falls .....	.....	1,800
" No. 28	Buckhorn.....	.....	500
" No. 30	Fenelon Falls.....	725	1,000
Power purchased from Corporation of Campbellford at Dam No. 12		16,825	45,200
Power purchased from Peterborough Hydraulic Power Co., Peterborough		1,250	
		1,120	
Total developed power available		19,195	

The control of the flow of the river is being constantly improved, and it is hoped that still greater success will attend the efforts being made, to utilize to the fullest extent, the natural storage basins in the Trent Valley, thus securing a uniform and unfailing supply of electric power at all seasons of the year.

Transmission Lines -

The diagram on another page will indicate clearly the extent and nature of the transmission system. Operation is conducted at 44,000 volts on most of the network, the exceptions being the line between Fenelon Falls and Lindsay, which operates at 11,000 volts, and the line connecting Dam No. 2 and Dam No. 5, which operates at 6,600 volts. All future developments at and in the neighbourhood of Trenton, will operate at this voltage, and will all feed into a switching and transformer station at Dam No. 2, where the voltage is stepped up to 44,000 volts for transmission. The total length of transmission lines is 285 miles. Additional lines will be constructed for the improvement of voltage regulation, and the duplication of service to safeguard against interruptions. Wooden poles are used throughout.

Substations

The following substations are connected to the transmission system and step-down the voltage to distribution or utilization voltage. Three-phase transformers are used entirely for capacities of 300 K.V.A. or larger.

The substation at Oshawa contains, in addition to transforming equipment, a stand-by unit consisting of a 400 K.W. generator, direct connected to a 615 H.P. Diesel oil engine. This unit is not used except when necessary in case of inter-

ruptions, but is kept in readiness at all times, and can be placed in operation in a very few minutes.

SUBSTATIONS

Location of Substation	Total transformer Capacity, K.V.A.
Belleville	2,250
Bowmanville	1,500
Brighton	300
Canada Cement Co., Lehigh Mill	3,000
Canada Cement Co., Belleville Mill	2,250
Cobourg	600
Colborne	100
Deloro	750
Deseronto	600
Lindsay	3,060
Madoc	480
Millbrook	100
Napanee	600
Newcastle	100
Oshawa	2,250
Peterboro	5,250
Port Hope	750
Point Ann Quarries	600
Pulp Mill, Campbellford	2,250
Sulphide	780
Treaton	1,350
Total	28,920

Municipalities Served

The distributing systems, instead of being owned and operated by the Municipalities as on the Niagara and other systems, are operated directly by the Commission, until such times as the Municipalities may desire to purchase and operate them under Local Commissions. The Corporations of Whitby, Madoc and Stirling are exceptions, and these Municipalities already control their own distributing systems, obtaining their supply of power through the agency of the Commission.

The complete list of Municipalities served is as below:—Belleville, Bowmanville, Brighton, Cedardale, Cobourg, Colborne, Deseronto, Lindsay, Madoc, Millbrook, Napanee, Newcastle, Newburgh, Oshawa, Orono, Peterborough, Port Hope, Stirling, Trenton, Tweed, Whitby.

Rates

The rates used by the former owners of the property have been continued in force pending the compilation of sufficient operating data to permit the determination of the cost of power delivered at the various Municipalities. It is expected that this will be completed early enough to permit of placing in effect a new schedule of rates in the Commission's standard form at the beginning of the year 1917. All flat rates will be extinguished as quickly as possible, and power contracts as they mature will be altered to conform to the Commission's standard form of contract.

Future Developments

The demand for power throughout the district is increasing very rapidly, and in order to meet this demand, additional transmission lines will be constructed next year, and additional generating units will be installed at Healey Falls. It is also expected that new generating stations will be built at a number of the dams on the Trent river.

Gas and Water Plants

In addition to the electric properties, the Gas Plants at Oshawa, Peterborough, Cobourg and Napanee, and the Waterworks Systems at Cobourg and Trenton are operated by the Commission at present, although it is expected that the Municipalities will desire to purchase these properties and operate them as municipal enterprises. Improvements have been made to most of these plants to cope with increased demand and to secure higher operating efficiency.

Peterborough Radial Railway

This property is at present operated by the Commission, but as the City of Peterborough have signified that they would prefer to operate it, it is likely that the road will be purchased by the city during the coming year.

Northumberland Pulp Mill

This mill is situated at Campbellford, and manufactures ground wood pulp. Supplies of raw material are obtained in the northern townships of the Counties of Hastings and Haliburton, and negotiations have been carried on with a view to the purchase of timber limits, which would assure a supply of pulpwood for many years, in addition to a large number of cedar poles. As the operation of this mill is outside the scope of the usual activities of the Commission, it is probable that negotiations now under way will result in the sale of the mill.

Cobourg

For some years the waterworks intake pipe had been of insufficient capacity, and in a precarious condition from exposure to ice pressure and storms, and contracts were let in July to John E. Russell for the installation, and to The Thor Iron Works for the material, of a steel intake pipe 25½-inch diameter and 900 feet long, to be laid in a trench excavated in the rock bottom of Lake Ontario; together with a large suction well housed in an annex to the present pump house. This work has been completed with steel intake box, screens, new suction main and reservoir connections, at a cost of about \$36,000.

At the same time the four motor-driven turbine pumps have had all the interior parts renewed, including impellers of larger diameter, to meet the demand for increased pressure.

Estimates have been prepared for the installation of gasoline-driven turbine pumps to replace the present steam standby plant, and for a sewerage disposal system to serve the pumping station and the engineer's residence.

At the gas works the old bench of 4 S has been replaced by a modern half depth bench of 4 S complete with hydraulic main and tar regulator. This bench meets the demand for gas except during the summer season, when the bench of 6 S is in use.

Peterboro

Increased service given by The Peterborough Radial Railway has rendered necessary additional pit accommodation in the car barns, and a new pit to take three cars, with pockets for the convenient removal of wheels and axles, has been built.

The track within the paved area on the Jackson Park line has been fitted with continuous rail joints, with the result that car maintenance has decreased and the operation of this section of the railway has been considerably improved.

At the gas works, a small annex has been built at the rear of the boiler house, and a new oxide room and general storehouse is being built adjacent to the present workshop.

A new generator has been installed as a spare in order to enable the present generator to be properly repaired from time to time, and consideration has been given to the completion of a second carbureted water-gas unit with modern condensing and scrubbing equipment, also to the completion of the purifier plant, half of which was installed in 1913.

Valuations of the physical assets of the Radial Railway and the Gas Works commenced by the Electric Power Company have been completed.

Oshawa

The rapid increase in demand for gas within the last few years has resulted in serious deficiency of holder capacity. The present holder was designed for the addition of a flying lift, and is of English manufacture. Owing to British Government restrictions, it has not been possible to obtain a quotation from the makers on the completion of this holder. The installation of a complete coal-gas plant has been under consideration, and additional land has been purchased adjoining the gas works property to accommodate such a plant, which would be of capacity sufficient to meet all demands for gas, except peak loads in summer, and these would be taken by the present water-gas units.

Northumberland Pulp Company

Owing to certain changes in the wiring of one of the grinder motors, and the installation of an additional wet machine, to meet the heavy demand for pulp, the three hydraulic presses are now deficient in capacity and a fourth press is being built by the Boomer Boschert Company, of Montreal, to give 300 tons with the hydraulic pressure now in use in the mill, and an ultimate pressure of 600 tons with a capacity of 15 tons per day and reduction to 60 per cent. air dry.

In connection with these presses a triplex pump of comparatively low pressure is being added, which will accelerate the speed of the presses during the major part of the stroke, leaving the final heavy pressure to the present hydraulic pumps.

Nipissing

Estimates and drawings have been made for a new building adjacent to the old gas house at North Bay, for storage and garage purposes, but it was decided that the work should not be proceeded with this year.

A sewage disposal plant was laid out, and is being built in connection with the power house at Nipissing, and in accordance with the requirements of the Public Health authorities.

Arrangements have been made and orders placed for the remodelling of the gate mechanism of one hydraulic turbine, the existing devices being insufficiently rigid to allow of proper control of the unit by the governor. The other unit in this station was treated some years ago in a similar manner with marked success.

MUNICIPAL ELECTRICAL INSPECTION

During the past year great activity has characterized the work of the department through the Province. The introduction of new legislation has placed the control of electrical installations in the hands of the Commission in a much more effective manner than existed before the Act of 1916.

At the present time there is some confusion between the Power Commission Act, the Cinematograph Act and the Mining Act, which should be adjusted. Experience during the past year has also disclosed the necessity for the introduction of some further amendments to the present regulations, but the present Act, together with the rules and regulations, has been very effective and tended to improve conditions greatly.

The introduction of compulsory permits has been very effective, and through its introduction the irresponsible wiremen, amateurs, and unskilled persons are now obliged to notify the department before they undertake to do any electric wiring for light or power, so that under a rigid enforcement of this clause promiscuous work will be reduced to a minimum. In order to enforce this law it has been necessary to subpoena a number of offenders to court, and in all cases the magistrates have at once seen the necessity and wisdom of the law, and fines have been imposed as required by the Act. This is creating a very marked respect for the Act, and is very highly commended by the better and responsible wiring firms throughout the Province.

In many large factories and other buildings where a local electrician or engineer has been in the habit of doing the wiring, making alterations and repairs, much very defective wiring and the mutilation of what was once good wiring was a common practice, and a method of controlling this has been formulated by the adoption of a system of monthly inspection at a nominal annual inspection fee. Under this system any concerns thus employing their own electrician are at liberty to proceed with such alterations or repairs to their wiring without the formality of obtaining a permit for each and every job. Upon payment of a small annual fee of from \$10 to \$100, according to the extent and proportion of the place to be thus inspected, the electrical inspector makes a monthly visit to each factory or building, going over all work done during that month, and reporting any defects to the owner, who is obliged under the Act to see that the defective work is corrected. Owners will then, in their own interest, see that their electricians, or others entrusted with this work, are competent. The introduction of this method is only being commenced now, and promises to develop to very large and profitable proportions.

During the past year we have been able to place trained inspectors in charge of all districts in the Province, rather than depend upon the services of local superintendents of supply companies, as was done in some districts. By a judicious distribution of inspection offices throughout the Province, there is hardly, with the exception of one small section in the extreme north of New Ontario, a municipality or community without electrical inspection.

Under a re-arrangement of the inspection districts we have in some places been able to relieve two or more inspectors, and place the districts they once controlled under other inspectors. This has been accomplished by consolidating the several small districts into one, and with the service of a small runabout the inspector is able to handle all the work to a much better advantage.

During the year there has been recorded 100,787 actual inspections made throughout the Province. This figure represents actual visits of an inspector to an electrical installation, and does not include a vast number of inspections on old work, which are made during the inspectors' rounds, of which no record is kept.

There is a marked increase in building activity, and a consequent increase in the work, and the prospects are that, with the introduction of the monthly factory inspection, the coming year will be an extremely busy one.

The new edition of Rules and Regulations has been published and largely distributed. This edition contains amendments to take care of new conditions which are ever presenting themselves in the way of evolutions and improvements in electrical construction work, and also contains under the same cover a copy of the Act.

We have enjoyed the good will and hearty co-operation of the best electrical firms in the Province, as well as that of the Fire Marshal, who has been active in probing the cause of alleged electric fires, and the Electrical Inspection Department has rendered him all the assistance possible.

All district inspectors report daily to the Chief Electrical Inspector at Toronto, who reports to the Chief Engineer.

A supervising inspector is constantly employed on the road visiting the various districts and checking up the work of the district inspectors, and generally assisting the Chief Inspector in the administration and general supervision of the department.

A number of new municipalities have been added to the large list contained in last year's report, and the wiring in many municipalities has been carefully gone over, and recommendations made by our inspectors towards eliminating dangerous wiring, with good effect. While a great deal has been accomplished in this respect, much more could be done if it were not for the scarcity of skilled labour. We have found owners of buildings, as a general rule, ready to heed the warnings of inspectors, and to proceed with such changes and overhauling as required by our inspectors, just so soon as labour and material could be found.

MUNICIPAL PURCHASES AND SALES

The municipal electrical enterprises in Ontario require in the aggregate large quantities of poles, line wire, cross arms, insulators, transformers, house service meters and of everything needed for the construction and maintenance of their various projects.

This demand can, in a measure, be filled by individual municipal purchase, but this is not always satisfactory. Owing to the wide range in the variety of materials and in the requirements, the municipal officials may lack the equipment necessary to properly safeguard their interests, and may not know exactly what should be used and where it can be obtained to the best advantage. The requirements of an individual town are comparatively limited. It cannot always afford large quantities and accordingly has to pay higher prices. At times rush orders

may be placed for urgently needed material, which through lack of provision, may not be in stock. For these and other reasons individual effort of this kind often means through lack of co-operation the more or less indiscriminate purchase of smaller quantities at higher prices, and the absence of an effective means of control which would tend to standardize quality and efficiency.

If the large requirements of the municipalities as a whole were combined and centralized, there would be created a purchasing agency which could control the various commercial conditions so that each municipality could obtain its comparatively smaller requirements under the favorable conditions attending competitive wholesale purchase.

To give practical effect to this centralized purchasing idea the Commission maintains a Purchasing Department whose services are offered to any municipality or Provincial institution in Ontario, whether connected with the Hydro system or not.

During the past year we have been buying for one hundred and fifty-three municipalities. Their total requirements, of over \$700,000, have enabled us to obtain for them at prices lower than those previously available all of the many items required in the extension of their various projects. On transformers, lamps, watt-hour meters and rubber covered wire we have been able to effect savings of from five to fifty per cent. over the prices previously paid. These are only a few of the economies effected, but will serve to show what can be done by co-operation.

A feature of this centralized service to which attention should be directed is the possibility of intelligent discrimination. Low cost is important, but it should not be the only consideration. It is necessary to know that the article purchased represents good value for the money. We have on our staff men who are experts on the many materials and processes which enter into the make-up of the various items used. In addition, we have complete equipment for standardizing and testing. Full use of these resources is made by our Purchasing Department, so that it is in a position to know that the materials recommended represent the best values obtainable. We call attention to this as we have appreciated that such complete facilities are seldom available to the individual towns, and we want to make it perfectly clear that this service has been organized for their benefit and is available for the asking.

The reduction in Hydro rates has greatly enlarged the possibilities of electric service in the household and on the farm, and the sales of irons, air heaters, motors, and all of the many other utilities, have been greatly increased.

To assist the municipal officials in the promotion of this revenue producing business the Sales Department made a careful investigation of the merchandising conditions, and as a guide in formulating campaigns complete data was secured of the methods adopted by the leading electrical companies. This information has been condensed and is available for municipal use. A number of the municipalities have availed themselves of this service and have found that the broad gauged, progressive policies outlined have enabled them to show a very substantial increase in their sales of utilities.

In building up this business they have been further assisted by definite advertising campaigns, from which gratifying results have already been derived.

The services of the Sales and Advertising Department are freely offered to any of the municipalities in Ontario, and information in connection with this subject will be gladly given upon request.

RURAL POWER

USES ON A GROUP OF FARMS IN WATERLOO TOWNSHIP

A further report of the operation of Syndicate No. 1 is submitted for the year 1916, for purposes of comparison with the report on same Syndicate as submitted in the 1915 report.

As a result of the satisfactory operation of the outfit of this syndicate, 12 new farm contracts were signed on the Waterloo-St. Jacobs road, and two more syndicates formed.

Waterloo Township Syndicate

WORK DONE JANUARY 1st, 1916, TO JANUARY 1st, 1917

No. 1 Farm, E. C. Hallman

Silo filling	30 ft. in 12 ft. x 42 ft. silo.
Threshing	960 bushels wheat.
	1,800 " mixed grain and oats.
Chopping	1,900 "
Sawing wood	15 cords.

No. 2 Farm, I. C. Hallman

Silo filling	24 ft. in 14 x 39 ft. silo.
Threshing	1,000 bushels wheat.
	1,950 " oats.
Chopping	2,000 "
Sawing wood	18 cords.

No. 3 Farm, J. S. Stauffer

Silo filling	30 ft. in 12 ft. x 40 ft. silo.
Threshing	900 bushels wheat.
	1,500 " oats.
	800 " mixed.
Chopping	2,200 "
Sawing wood	10 cords.

No. 4 Farm, Noah Snyder

Silo filling	15 ft. in 10 ft. x 22 ft. silo.
Threshing	250 bushels wheat.
	1,100 " oats.
Chopping	1,200 "
Sawing wood	15 cords.

No. 5 Farm, Uriah Snyder

Silo filling	14 ft. in 11 ft. x 30 ft. silo.
Threshing	500 bushels wheat.
	1,000 " mixed.
Chopping	700 "
Sawing wood	15 cords.

No. 6 Farm, Alvin Schieffle

Silo filling	15 ft. in 14 ft. x 40 ft. silo.
Threshing	600 bushels wheat.
	550 " oats.
	1,200 " mixed.

G. Shanty

Threshed	300 bushels.
	1,000 "

Waterloo Township.—Syndicate No. 1

Uses January 1st, 1916 to January 1st, 1917

Rate—Service Charge \$30.00; Power 4c. per K.W.H. Discount 10% from power only

No.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total K.W.H.	Domestic	Power	Service Charge	Total
1	90	47	43	34	35	29	24	32	40	53	72	73	572	20.59	38.66	35.00	94.25
2	77	49	48	41	37	33	34	44	48	54	77	62	604	21.74	53.92	30.00	105.66
3	53	34	22	21	25	17	16	22	25	25	49	41	350	12.60	43.63	30.00	86.23
4	74	46	48	42	38	37	30	33	35	46	66	65	560	20.16	20.34	35.00	75.50
5	43	21	14	11	15	7	8	12	12	21	35	31	230	8.28	19.69	30.00	57.97
*6	25	26	22	16	13	8	8	14	19	26	32	41	250	9.00	45.29	30.00	84.29
													2,566	92.37	221.53	190.00	503.90
1	.....	91	73	.....	.....	.....	.....	362	110	.....	438	.....	1,074	.....	.....	.....	.....
2	120	.....	128	170	87	35	.....	331	579	.....	.....	48	1,498	.....	.....	.....	.....
3	36	91	83	141	43	26	.....	317	82	45	348	.....	1,212	.....	.....	.....	.....
4	80	.....	.....	65	61	.....	.....	.....	28	37	294	.....	565	.....	.....	.....	.....
5	32	.....	.....	62	.....	.....	.....	129	22	30	.....	272	547	.....	.....	.....	.....
6	.....	78	68	65	63	14	.....	59	20	34	563	294	1,258	.....	.....	.....	.....
7	264	.....	.....	.....	.....	.....	.....	.....	.....	62	.....	.....	326	.....	11.74	9.00	20.74
													6,480	92.37	233.27	199.00	524.64

See Record of Detail of work done on page 187.

ORNAMENTAL STREET LIGHTING

REVIEW

The installations of "White Way" systems made in many Hydro municipalities during the past few years have been received with approbation by the public in general.

The success of such installations has encouraged engineers engaged in their design and construction to make further investigations, resulting in the production of lighting units of improved appearance, and more effective in the utilization of light. Economy in first cost and in maintenance has also resulted and equipment has been devised which will render the continuous operation of street lighting circuits more secure, and provide additional safe guards against accidents to employees.

As might be expected, the "White Way" system has attracted more attention than what is usually designated as the "ordinary" street lighting system, which is generally installed in residential districts. However, the equipment for the "ordinary" lighting units has been the subject of much thought, and the improvements which have been made are noteworthy. Improvements in this system of lighting are the more important as by far the greater area of streets illuminated comes within this class.

The gas-filled incandescent lamp has become firmly established, and is now being installed in all new "series" systems to the total exclusion of the arc lamp, as well as the evacuated incandescent lamp. The Commission's engineers have made special investigations concerning gas-filled lamps, which will be supplied in the near future to the Commission's specifications, resulting in a great saving to the municipalities.

Heretofore the use of the "series" system of street lighting has not been considered feasible except in cities and larger towns, where a considerable number of lighting units is required. Hence, the smaller municipalities have been debarred from obtaining the benefits of the "series" system, which is, in many ways, ideal for street lighting service. Due to recent developments in the regulating apparatus, which is required for the satisfactory operation of the "series" system, the latter is now available for even the smallest village.

INSTALLATIONS

Almonte

A complete new street lighting system is now being constructed in this municipality under the supervision of the Commission. The existing D.C. arc lamps will be taken out of service.

Blenheim

A "White Way" system of ornamental standards fed by underground cable has been installed; the lights were put into operation during the week ending January 8th, 1916.

Cobden

A street lighting system is being constructed in Cobden under the Commission's supervision.

Cobourg

At the request of the municipality the Commission has submitted plans and estimates for a new street lighting system to replace the present system of enclosed arc lamps.

Ingersoll

The Commission's engineers, on the request of the municipality, made recommendations concerning the installation of a "White Way" system on Thames Street. This system is now being constructed by the local authorities, and all the equipment has been supplied by this Commission.

Norwich

This municipality has been advised regarding the installation of a "White Way" system, and has constructed the same, the equipment being purchased through this Commission.

Sarnia

A new system of street lighting is now under construction, planned and installed under the supervision of the Commission. Some 650-100 watt units are required for the residential streets, and 76-500 watt units in the commercial district. Combination railway and lighting poles of tubular steel are being erected and the "White Way" units will be mounted on them. The circuits will be carried overhead, except at the Square in front of the City Hall, and in the park at the Public Library.

Petrolia

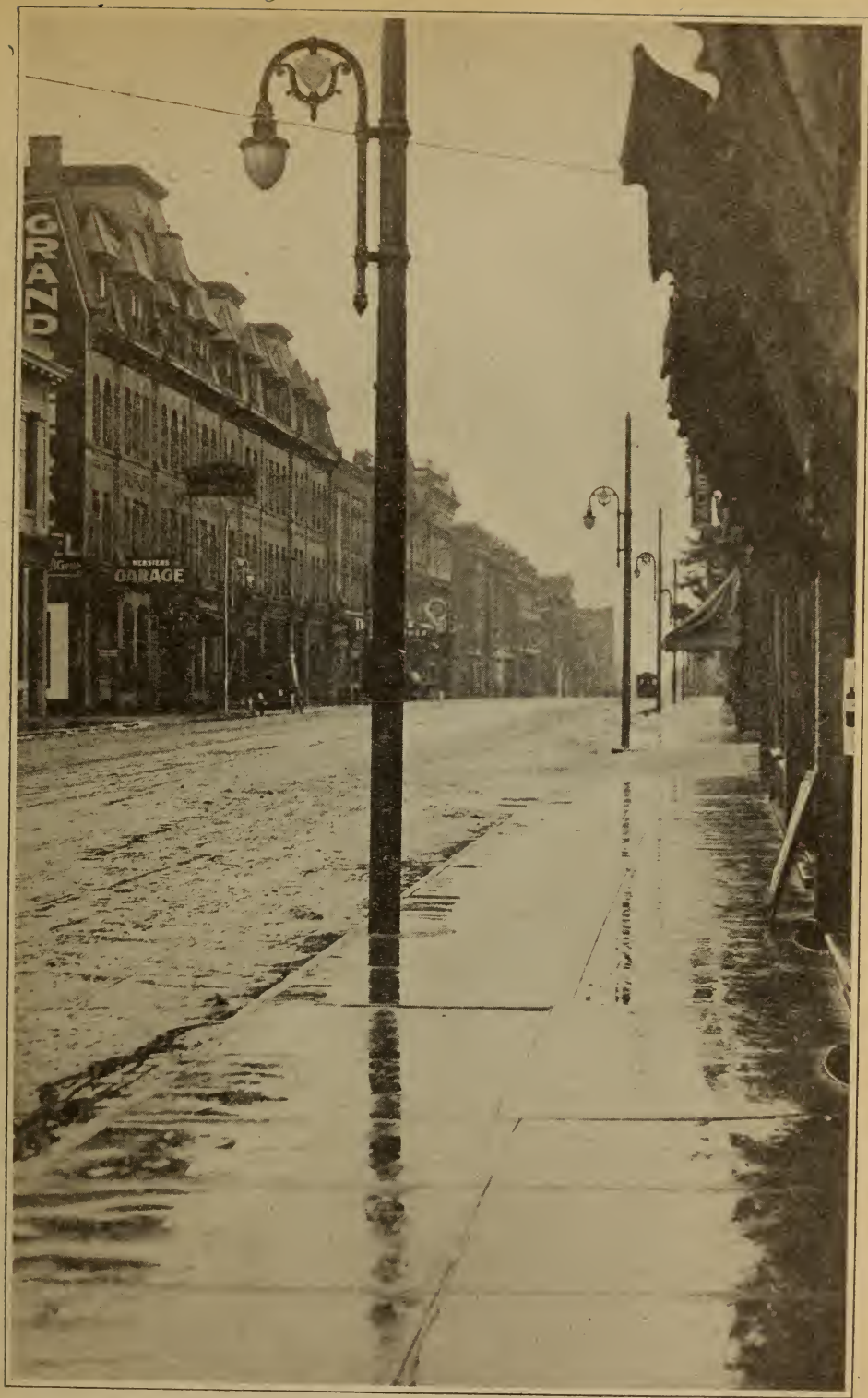
A "White Way" system according to recommendations from the Commission has been constructed in Petrolia. Lights were put into operation on April 25th, 1916.

Ridgetown

A "White Way" system fed by underground cable was installed in Ridgetown and placed in service during the last week in December, 1915.

GENERAL

Special equipment for Ornamental Lighting has been supplied to a number of municipalities; others have been provided with estimates or recommendations regarding existing or proposed installations; these municipalities include Amherstburg, Chatham, Dunnville, Exeter, Guelph, Huntsville, Kingston, North Bay, St. Catharines, Stratford, and Windsor.



St. Thomas White Way
Note the combination railway and lighting poles



St. Thomas White Way

Note the several lines of wooden poles on both sides of the street. These have been removed

MUNICIPAL UNDERGROUND CONSTRUCTION

There has been but little activity in underground construction during the past year, in accordance with the general policy of eliminating expenditures for all works not absolutely necessary at the present time.

Hamilton

Cables have been installed in the Joint Underground Conduit System, and are now being operated by the Hamilton Hydro-Electric Department and the Great North Western and Canadian Pacific Railway Telegraph Companies.

St. Thomas

In connection with the new municipal sub-station, manholes and conduits have been installed to carry the distribution feeders underground from the sub-station to the overhead pole lines.

Owen Sound

A twelve-duct underground run with manholes was constructed leading from the new municipal sub-station to the overhead distribution system. The cables were placed in operation in January, 1916.

ELECTRIC RAILWAY PROJECTS

A number of resolutions from Municipal Councils asking for reports on additional electric railway projects were received during the year. In some cases these resolutions were from Municipalities who had already requested to be considered in one or more lines in their particular district. No attempt has been made to keep track of these duplicate applications, but to date resolutions have been received from 15 cities, 47 towns, 51 villages, 8 police villages, 172 townships and from 7 counties or other similar governing bodies. A total of 300 resolutions has, therefore, been received since the passing of the first railway act. In response to these resolutions the Commission has made preliminary surveys on 2639.46 miles of line, and has gathered traffic statistics for approximately three-quarters of the district affected by such surveys.

The map of south-western Ontario as found on the following page shows in black the routes covered by the principal surveys that have been made in that section of the Province, and also in green the lines upon which reports have been made. The projects which have been voted upon and carried by the ratepayers are indicated in red. Other surveys not shown on the map were made as follows:—

1. Gravenhurst to Baysville and Hollow Lake.
2. Kingston to Cornwall.
3. Ottawa to Morrisburg.
4. Various lines in Prince Edward County.

In addition to engineering and traffic surveys considerable work was done during the year on preparation of standard drawings and specifications for construction and equipment of the proposed lines. This work is being carried on in a very careful way, as it is felt that considerable savings in cost of construction

and operating of the various lines will be possible if they are all built to conform to the same specifications.

The most outstanding events of the year as related to the proposed system of municipally-owned electric railways were:—

1st. The voting on the Toronto-London Line.

2nd. The commencement of the campaign for the Port Credit-St. Catharines and Welland-Bridgeburg Lines.

3rd. The remarkable success achieved by the London-Port Stanley Railway during their first year of service.

Proposed Toronto-London Line

A report on the Toronto-London Line was given to the municipalities interested in the Fall of 1915, and voting on the By-laws took place at the annual elections in January, 1916. The report covered a 137-mile line extending from the foot of Yonge Street, Toronto, westward along the new Harbor Board property, under the Exhibition grounds and parallel and south of the G.T.R. to one mile west of Port Credit, where the G.T.R. is crossed. From this point the line proceeds in a westerly direction through Milton, Guelph, Kitchener, Stratford and St. Marys to London, where connection would be made with the London and Port Stanley Railway at the corner of Richmond and Bathurst Streets. The estimated cost of construction and equipment was placed at \$13,734,155. Further details of the route and distribution of the guarantee can be obtained from the form of agreement as contained in the *Railway Act* for 1916, which Act will be found in this report under the heading of "Legal Proceedings."

A number of Public Meetings were held in the Municipalities voting on the By-law, at which representatives of the Hydro-Electric Railway Association and the Commission were present. Considerable opposition to the scheme developed, chiefly in the City of Toronto, where the Board of Trade opposed the scheme very strenuously both at the Public Meetings and in the daily papers. The opposition seemed to assist rather than retard the interest in the project, and the By-laws were carried by very large majorities in the 5 cities, 3 towns, 4 villages and 11 out of 14 townships interested. Some 5 townships that were assessed very small amounts for the guarantee, due to the line passing only close to or through a corner of the municipality, did not vote upon their By-laws.

The agreements with the municipalities that carried their By-laws were duly signed and were ratified by Act of Parliament in the Spring of 1916, but this Act, while legalizing the agreement, expressly states that no construction can be undertaken during the period of the war. Provision is made, however, for the carrying on of location surveys and the purchase of property for the right-of-way.

Proposed Niagara District Lines

A report on a 60-mile line from Port Credit through Hamilton to St. Catharines was presented to delegates from the municipalities in that district at Hamilton on September 1st, 1916. The feeling of the meeting was so unanimously in favour of proceeding with the scheme that representatives of the Hydro-Electric Railway Association and engineers of this Commission were sent to the Council of the Municipalities with full details and resolutions were then passed asking the Commission to secure the necessary sanction of an agreement to provide for the construction and operation of the line and to secure such sanction in sufficient time so that voting on the proposition might take place on January 1st, 1917.

HYDRO-ELECTRIC POWER COMMISSION

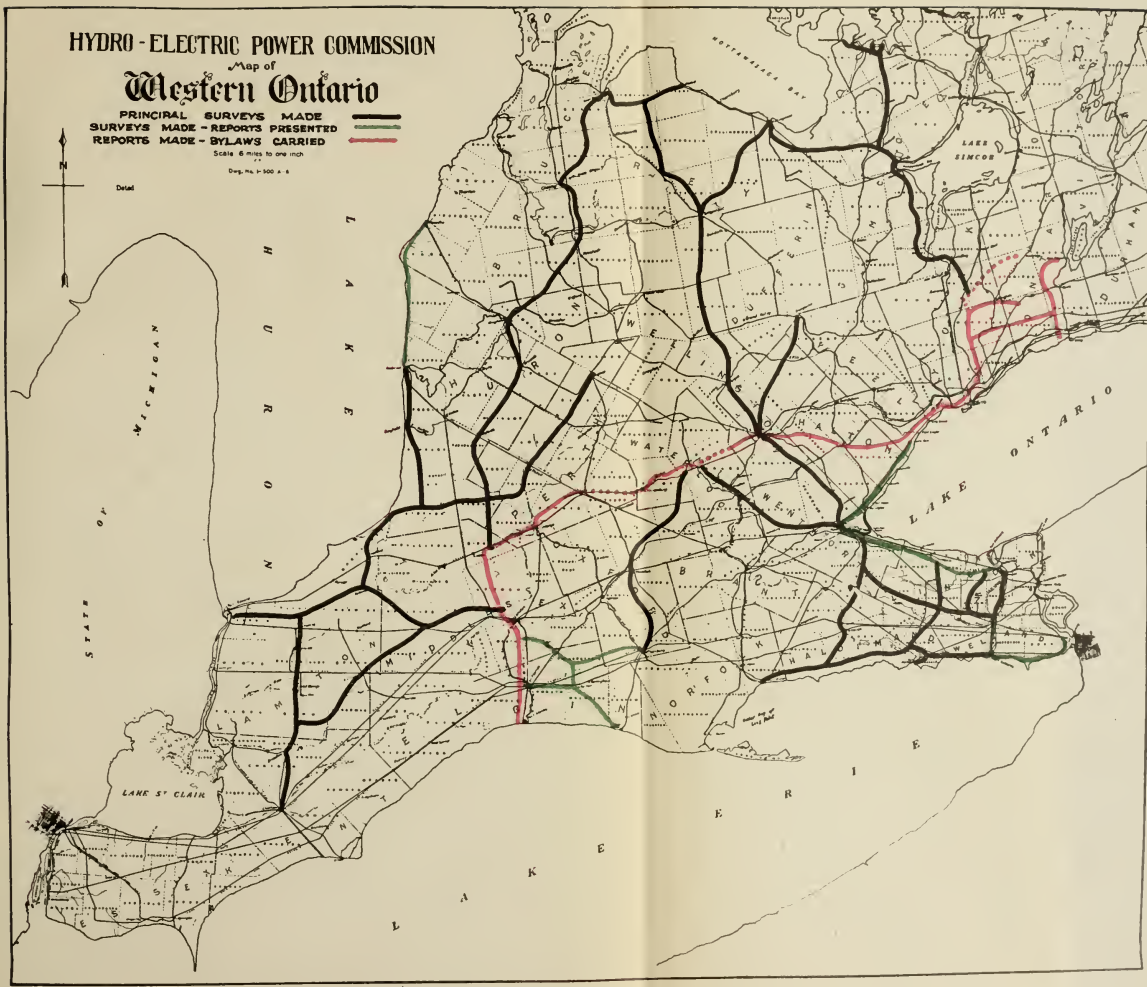
Map of Western Ontario

PRINCIPAL SURVEYS MADE
SURVEYS MADE - REPORTS PRESENTED
REPORTS MADE - SYLLAWS CARRIED

Scale 6 miles to one inch

Dep. No. 1-500 A-1

Detail



The ratepayers in the Welland-Port Colborne-Bridgeburg district have been desirous for a number of years of securing electric railway service through that district, and although the Commission was not prepared to give final decision on a through route to the Niagara Frontier, still they found from the traffic surveys that there was sufficient local business to make the construction of a local line a splendid proposition, irrespective of the location of the through line. A general report was at once presented to the Councils of the municipalities interested and they passed resolutions requesting the Commission to procure the sanction of the agreement so that voting on the proposition may take place at the annual elections in January, 1917.

Two lines will, therefore, be voted upon in January next, the first 60 miles in length extending from Port Credit westerly through Oakville, Burlington, Hamilton, Grimsby and Beamsville to St. Catharines, and the second line 28 miles in length extending southward from Welland to Port Colborne on the east side of the canal, and from thence easterly through Ridgeway, Crystal Beach and Fort Erie to Bridgeburg. The estimated cost of the Port Credit-St. Catharines line is placed at \$11,360,363 and the Welland-Bridgeburg line at \$2,208,716. The construction and equipment proposed for these lines would be of a very high standard and would be similar to that found on the London and Port Stanley Railway. A large proportion of the revenue will be received from the transportation of freight. The route through the City of Hamilton involves a high level bridge across the ravine at Valley Inn at the northern limit of the city, and the construction of a double-track line through the city, passing along the edge of Dundurn Park and hence on private right-of-way through the manufacturing district to the easterly boundary of the city. There would only be one or two minor highway crossings at grade within the city limits.

London-Port Stanley Railway

This electric railway reconstructed and electrified under the Commissions' standard specifications, finished its first year of operation under municipal management on June 30th, 1916. Previous reports of this Commission contain information showing the manner in which this railway was assisted in the reconstruction and electrification and consequently the results achieved by this line may be used to illustrate the service that will be given over the various lines that have been favorably reported upon by the Commission. The report that has just been issued, covering this first year of operation indicates that the line after meeting all charges, including taxes, interest, rentals, etc., and full sinking fund charges on the new investment, yielded a surplus of some \$24,000. This is considered a remarkable success, as sufficient rolling stock was not available to carry all the business that was offered, and also the first few months of operation were not profitable because many of the side tracks were not electrified and the Michigan Central freight business was withdrawn and given to a competing line.

Officials of the line were assisted at various times during the year with engineering advice on the location of new tracks and other similar matters. Designs were also worked up for a 70-foot motor car which would become a standard of the Commissions. These new specifications are now being used by the L. & P. S. railway to secure tenders on two of such cars for their own use. These cars will be of the three-compartment type and will be very similar to the 60-foot cars now operating on this railway. The same high standards of interior finish, such as mahogany trim, bronzed fittings, plush seats, etc., as found on the earlier cars are also to be used for these new cars.

During the year this railway constructed a modern car barn, and in this work were assisted by the Commission from time to time, and the design of this building and equipment will probably be used on the various lines that have been reported upon by the Commission. Engineers were loaned the railway company for the purpose of assisting them in working out details of maintenance of equipment and instructing the employees connected with such work.

TESTING AND RESEARCH LABORATORIES

The activities of the laboratories have been extended in several directions during the past year. One of the most important extensions of the work has been the undertaking of comprehensive investigations of conditions on the high tension transmission lines; these include a theoretical study of voltage and current conditions at all stations, with a view to improvement in voltage regulation, a study of relay protection, of high tension insulators, of current and power supplied under short-circuit conditions at various points on the system, of the possibility of using steel for transmission line conductors and of many other subjects suggested by those mentioned above. These investigations are the result of the endeavors which are continually being made by the Commission, as well as by all large power companies, to perfect the transmission of power at high voltages. Their importance will be appreciated by the layman when the object in view is stated—to make it possible to supply electric power to the consumer without interruption and at constant supply voltage.

Reference should also be made to the label service operated by the laboratories in conjunction with the Electrical Inspection Department; further reference to this is made below.

During the year the handling of used apparatus by the Commission has been taken up systematically and a suitable method of carrying on this work was adopted; this is described in the November issue of the Hydro Bulletin. The inspection of this class of apparatus is done by the laboratories.

The number of mechanical and other non-electrical tests has so increased that it was considered sufficient to occupy the attention of a specialist in this line. Accordingly the Structural Materials Laboratory was organized and additional equipment for this class of work has been placed on order.

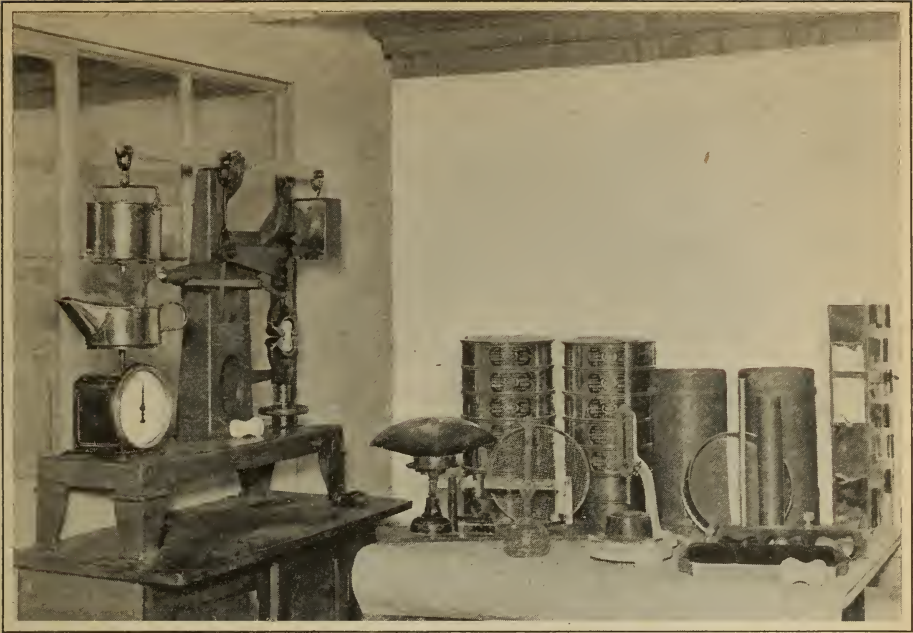
The following equipment has been added during the year:

An exciter for the 60-cycle alternator, a 33,000-volt transformer for testing oil and other insulation, a set of laboratory standard ammeters, voltmeters and wattmeters, a large number of portable and laboratory type meters, an integrating sphere photometer 84 inches in diameter, a 40,000-lb. Universal testing machine, a 200,000-lb. hydraulic compression machine, besides numerous smaller pieces of apparatus.

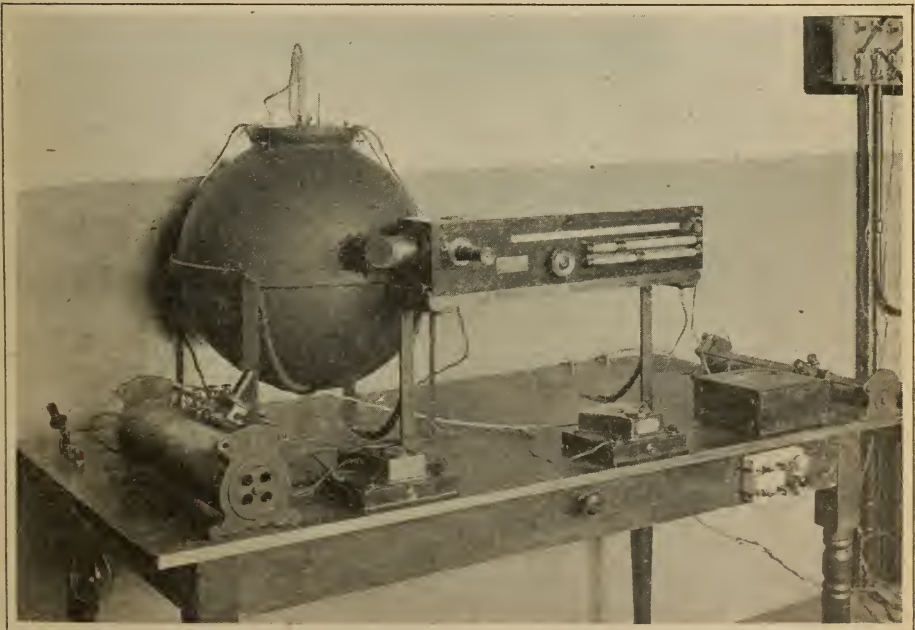
The extension of the test work has rendered the present space entirely inadequate to our needs and additions are at present being made which will make available for the laboratories about 20,000 sq. ft. When this space has been added the present testing equipment will be rearranged to suit the requirements of the laboratories.

High Tension Testing Laboratory

Previous reports have indicated the general purpose and development of this laboratory and in harmony with the increased scope and activity of the Com-



Cement and Sand Testing Equipment



18" Integrating Sphere Photometer, Lamp Testing Laboratory

mission as a whole, this department is continually widening its sphere of usefulness.

Routine tests are made on samples of all classes of apparatus purchased by the Commission from the high voltage tests on the insulators for the 110,000-volt lines and stations to small motors and switches for the small consumer. Apparatus is available from which any single-phase 25-cycle voltage up to 200,000 volts or 60-cycle voltage of 400,000 volts may be obtained and a great deal of work is done at 100,000 volts and higher.

One routine test which has an important value in the operation of the system is the testing of three hundred and fifty samples of oil each month, sent in from the high-tension stations on the system and taken from the 110,000-volt transformers and oil circuit breakers. In addition to the regular samples from twenty to fifty special samples per month are received from municipal stations. These are all tested for dielectric strength and records kept of the condition of this insulating medium are of inestimable value in forestalling failure of the apparatus due to faulty oil. Apparatus is under development which reduces the time and cost of these tests to a minimum and ensures very accurate results. Insulator testing also has a very important value to the system, and with the proposed extension of space available for the high-tension testing it is expected that high voltages and high frequency oscillations may be used that under previous conditions have been more or less unsatisfactory.

Special tests are made on apparatus purchased under guarantee by the Commission, either for its own direct use or for the use of municipalities for which it is acting in an advisory capacity. During the past year complete tests have been run on constant-current transformers, constant-potential transformers, motors, motor-starters, circuit-breakers, lightning arresters, fuses, rubber gloves and various other protective devices and apparatus. The result has been most beneficial in bringing the manufacturer and consumer to terms, sometimes by proving the good points of the article in question, at other times by noting the weaknesses and encouraging and advising the manufacturer as to the changes to be made in design or process of manufacture. The honest manufacturer invariably appreciates the fact that the laboratories exist for his benefit as well as for that of the general public and harmonious relations are the result.

Used apparatus, sold by one municipality to another, as the result of change in service supply, is sent for inspection to this laboratory, and the tests given to this apparatus are such as to test its ability to operate satisfactorily under any reasonable condition of service. Although the arrangements of this scheme were made quite recently, a considerable amount of material has already been transferred in this way.

The testing and approval of fittings and other apparatus has become an integral part of the work of this department, and activity among the manufacturers and dealers of this Province is evident from the amount of material inspected and the urgent need for its return as soon as approved. The laboratory co-operates in this work with the Inspection Department and operates a label service, by means of which approved apparatus is labelled. The utmost care is taken to approve no apparatus which would become hazardous when in or out of service, and suggestions are made as to the alterations necessary to meet with the approval of the Commission. In addition to approval tests in the laboratory periodical inspection is made in the factories with the object of seeing that no apparatus which does not comply with our requirements is placed on the market.

The scope of this department, as outlined in previous reports, includes general

tests on mechanical strength, quality of building materials, etc. The work of both electrical and mechanical sections has grown to such an extent as to warrant the formation of two separate departments, hence the general tests on strength of materials are not included in the work of the High-Tension Laboratory.

Meter and Standards Laboratory

The increase in the amount of energy transmitted and distributed has reacted in several ways upon the activities of the Meter and Standards Department. The large volume of power handled necessitates an ever increasing degree of precision in its measurement; and the greater number of consumers means a greater number of metering units to be maintained in accuracy. These and similar conditions have resulted in this Department now handling approximately twice the volume of work of a year ago.

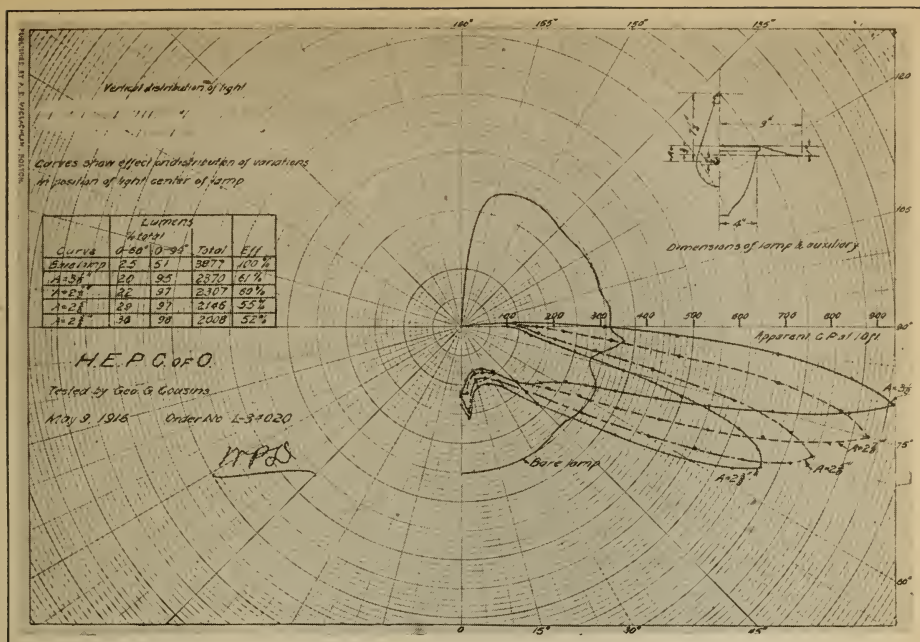
A complete set of Weston long scale standard indicating instruments has been placed in the laboratory, and pending further extensions to the building, temporarily installed; so that calibrations may be made on ammeters, voltmeters and wattmeters. By means of standard cells and standard resistances it is possible at any time to compare the accuracy of these laboratory instruments with the standards at Ottawa and at Washington. With the improved standardization equipment frequent checks are possible on the large number of portable meters used by the Laboratory and by the Operating Department. Meters are also being sent in by the municipalities and by electrical manufacturers in the Province for calibration.

The work of investigating various types of new apparatus as to suitability for installation upon the Commission's circuits has been energetically followed out. Complete comparative tests have been made on several improved types of watthour meters which have recently appeared on the market; and their high standing, according to the specifications indicates that the art of meter manufacture has advanced to a point where a revision of many of the ratings in the meter specifications is desirable, to give a useful value to the results. This revision is now under consideration. The investigation of demand indicators and other special types of metering apparatus has given much valuable information regarding the approach of the readings of various types to the true value of maximum demand, under loads of widely differing peak characteristics.

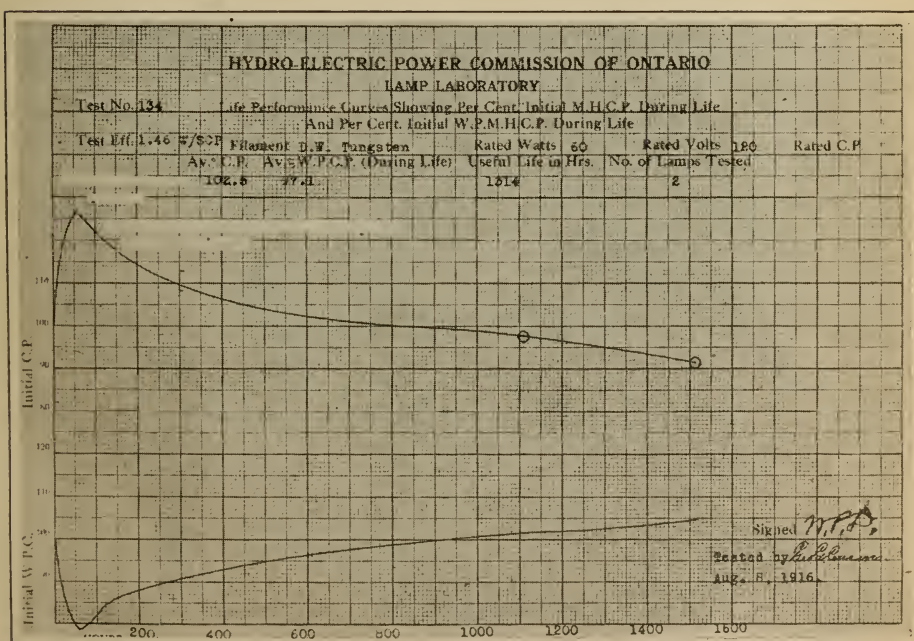
With a view to determining the most suitable indicating instruments for the switchboards, as the power systems are extended, a detailed comparative test was made on the meters of a number of manufacturers. These were submitted to practically every condition, normal or abnormal, under which such instruments might be expected to operate, and careful records made of their performance. The results so obtained contain much valuable information to guide in the selection of switchboard meters.

The problem of better protection of the great network of transmission lines against interruptions due to short circuits, grounds and other accidental conditions is being taken up by the Laboratory, and it has fallen to the lot of the Meter Department to make examinations and tests of a number of types of protective relays supplied for such work. Though these tests are not complete some very interesting results have been collected to show the comparative operation, as regards selective and other features under widely diverse conditions of load, temperature and location.

Considerable design work has been undertaken. This includes relays for motor protection, mechanical refinements to demand and other special meters, as



Curves of candle power distribution of a gas filled lamp equipped with prismatic refractor



Curves showing variation of Candle power and efficiency of a tungsten lamp with life

well as such auxiliary apparatus as may be required by the Laboratory for its own use. The construction of special meters, and the alteration of others to suit special conditions has occupied much time, the principal work of this class being the conversion of a number of polyphase wattmeters into "wattless component" meters. This consists in a simple modification of the resistances and connections so that by throwing a switch the converted meter may be made to read the reactive volt-amperes of a polyphase circuit. With a graphic "wattless" meter installed beside a wattmeter it is a simple matter to determine at any time the true power factor of the load, no matter how badly unbalanced the currents may be; while by throwing over the switch the instrument reads the power component and may be made to duplicate or replace the wattmeter in the circuit.

A large amount of repair work has been done in the meter shop for the municipalities. This has included watthour meters, defective, disputed or damaged through overloads or other causes, demand indicators, graphic and indicating instruments. In addition to this a systematic overhauling and adjusting of the meggers used by the Operating Department is carried on. By the nature of their work on insulator testing these meggers receive very heavy service and without periodic attention they would soon lose their usefulness.

The work which has shown the greatest increase is that of handling used apparatus. Old watthour meters in batches of from half a dozen to several hundred have poured in from all points. These are sorted out, the manifestly obsolete ones set aside and the others put through a schedule of cleaning, adjustment and recalibration. They are then either returned to the original owners or taken into stock to supply the great demand for used meters. Among those coming are many, some fifteen or more years of age, which because of obsolescence or inherently bad characteristics are immediately relegated to the scrap heap, where they are later joined by others which fail to show the required accuracy on the test board. For these an allowance is made to the owner for the value of the metal contained. About a thousand meters have in this way passed through the Laboratory.

The variety of meters carried in the storehouse stock demands supervision so that meters sent out on order will be suited to the requirements of the service. The Meter Department in doing this is often able to adapt to a special need meters which might otherwise lie unused on the shelves. Meters for Government inspection are taken into the test room where a representative of the Inland Revenue Department inspects them and applies the seal of the Department.

With a view to establishing a suitable basis of billing certain classes of power and lighting loads, several extended tests have been made on services of various classes. These include determination of demand by means of a graphic meter and a general consideration of all existing conditions. The loads so investigated include beside a variety of lighting services, printing offices, elevators, incline railways, metal works, woollen mills, electric signs and amusement parks.

A wide use has been made of the oscillograph, and by its use some very knotty problems made possible of solution. Early in the year the complete outfit was set up in the power house at Eugenia Falls and a complete examination made, with particular attention to special transformer connections. Photographic records were obtained of practically every electrical quantity in the plant; and an analysis of the oscillograms soon led to a decision as to connections best suited to the case in hand. Oscillographic records have also been obtained of currents flowing through the resistances used between ground and the neutral of the star connected 110,000-volt transmission lines.

A problem confronting the engineers of to-day is to design auxiliary apparatus to effectually prevent "flashing over" of high voltage rotary converters; and with this in view a number of oscillograms were obtained from the machines supplying the London and Port Stanley Railway. Records were obtained of operation under widely varying conditions of load and data obtained from these, which should result in great strides toward the elimination of flashovers and other troublesome features of machines of this type.

In addition to the special work described above the Meter Laboratory has been many times called into service to perform special tests for the Inspection Department, and to pass approval on relays and other apparatus manufactured either in the Commission's shops or elsewhere for use on the numerous lines and services throughout the Province.

Lamp Testing Laboratory

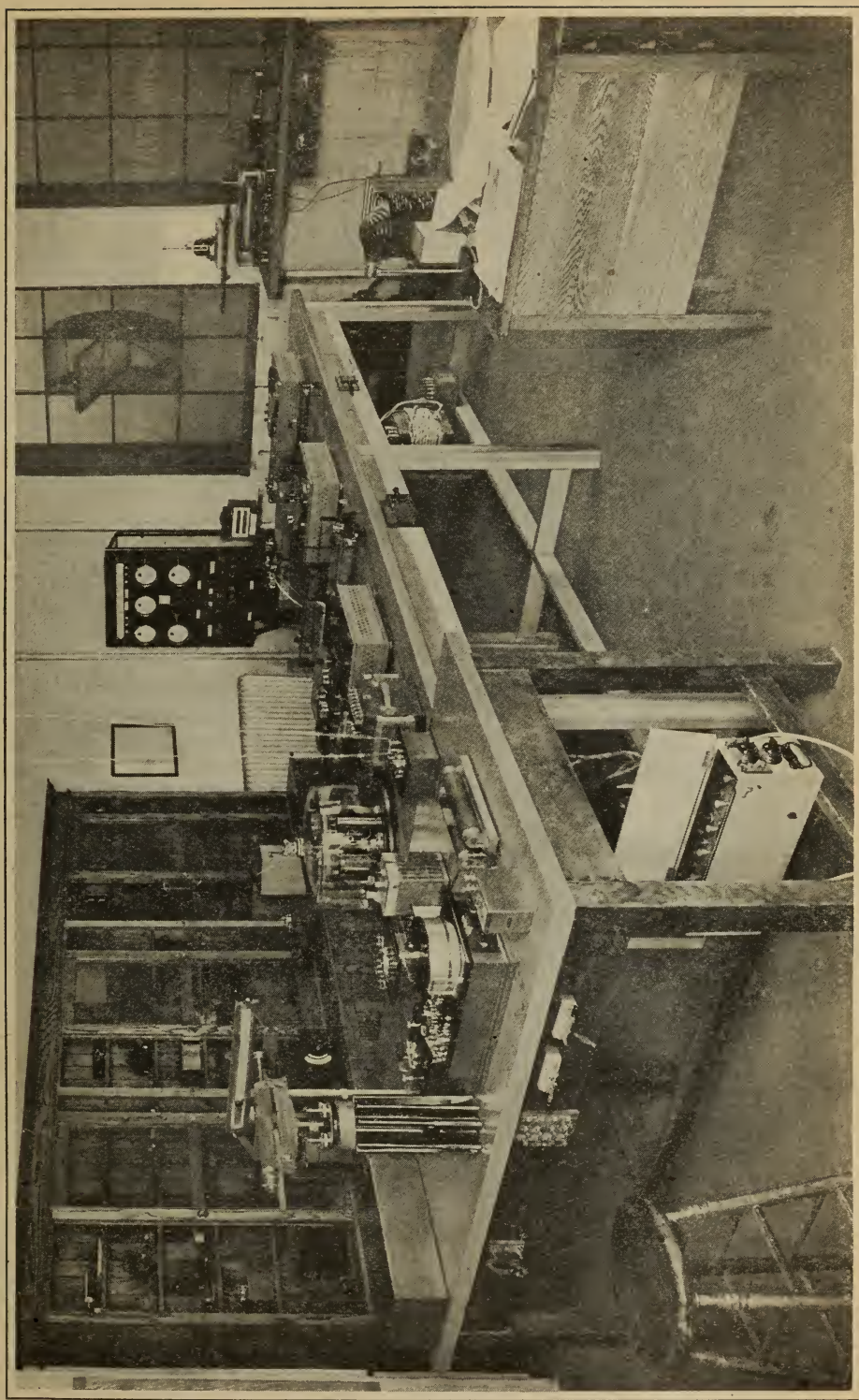
During the year just closed the lamp laboratory has continued the routine testing of lamps for stock. Such tests include tests for vacuum, rating and life tests, as well as inspection for mechanical defects. The volume of routine testing has been fully up to that of previous years, while the number of tests for parties outside the Commission has been considerably increased. These include complete tests on new types of lamps and life tests on manufacturers' samples.

A notable departure in our method of testing gas-filled lamps and vacuum lamps with concentrated filaments has been necessary. Candle power values for lamps of these types are no longer given in terms of horizontal candle power; the mean spherical candle power is the unit which is now used by the Commission to express the light intensity of such lamps, and the light output of the lamps is expressed in terms of lumens. This change is necessary because of certain inherent features of gas-filled lamps and because of different spherical reduction factors of concentrated filament vacuum lamps. These measurements are all made in an integrating sphere photometer. An 18-inch sphere was fitted up in the lamp laboratory and has been in use for the testing of the smaller sizes. An 84-inch sphere is being constructed of reinforced concrete for the testing of the largest sizes. This sphere is nearing completion. Specifications have been issued for the purchase of gas-filled lamps, embodying the changes in rating made necessary by the new methods of testing. This new method of test is in keeping with similar changes taking place in all lamp testing laboratories in America. All gas-filled lamps are now rated by most laboratories according to their lumens output or to their mean spherical candle power, the efficiency being expressed as mean spherical candle power per watt or as lumens per watt.

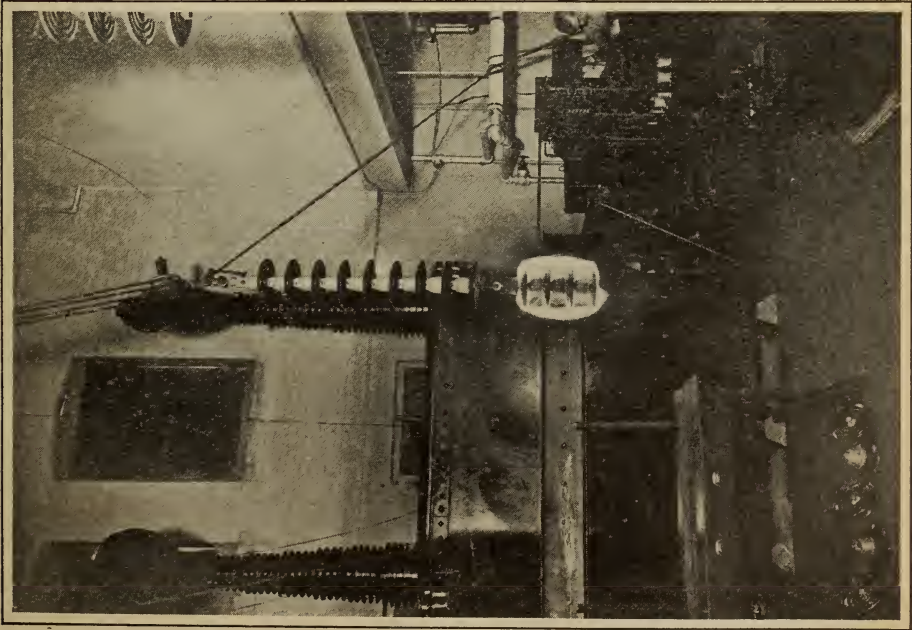
A new size of series lamp has been standardized by the Commission to consume 100 watts regardless of changes of efficiency that may occur due to improved methods of manufacture. The new 50 watt vacuum lamp recently placed on the market is being tested. Lamp frosting methods are being investigated and the laboratory is now in a position to frost all such lamps as may be required for the Commission's business.

A large number of tests have been made for various municipal managers. The Commission's policy of buying lamps in the open market for testing has been followed, thereby enabling us to keep in close touch with the output of many factories.

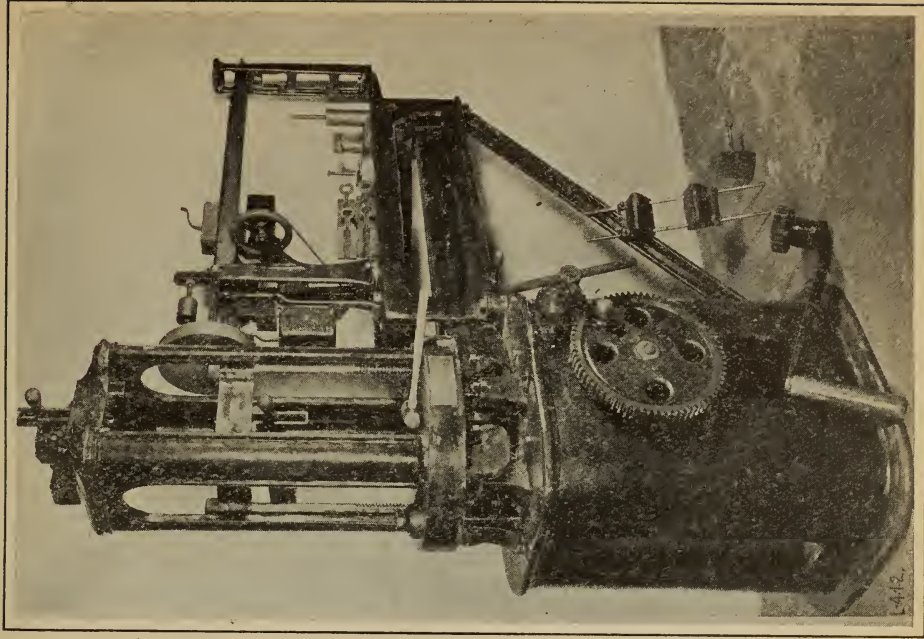
The work of this laboratory has been of value in detecting defective shipments of lamps, several cases of which have occurred within the past year.



Electrical Standards Laboratory



High Tension Test—Transformer Flashing Over String of Four
Suspension Insulators—Voltage 260,000



Testing Machine—Strength of Materials Laboratory

Illumination Laboratory

As the science of illumination advances new types of apparatus are produced and the Commission, through the illumination laboratory, is enabled to obtain first-hand data on new appliances as they appear. Several new types of street lighting fixtures were investigated during the past year as well as the modified application of older types. One of the problems arising out of the use of gas-filled lamps for street lighting is glare. The effect of bowl frosted lamps on the reduction of glare and their effects on the distribution of illumination when used in common fixtures were fully investigated. A very extended investigation of standard street lighting fixtures of the latest types was made. Representative samples of the product of several manufacturers were sent to the laboratory and were subjected to the most rigid tests to determine their optical, mechanical and operating characteristics. These tests included light distribution and efficiency, flashover tests on the insulators, puncture tests on film cutouts, accessibility of parts, general design and appearance and the effects of the various features on operation. For the first time in the history of the Commission diffusing globes were purchased on specification. A number of samples of various makes were tested and the make to be purchased was decided upon. On completion of the order the globes were tested to insure compliance with the specifications. The effect of different positions of the light-centre of lamps relative to the reflectors was studied with standard fixtures.

Illumination surveys were made of new installations of street lighting.

A number of fixtures and illumination tests were made for outside parties.

On the 84-inch integrating sphere being constructed in the laboratory provision is made for making efficiency tests on lighting units of all kinds. This feature is of particular value in making acceptance tests on globes and reflectors.

This department planned the lighting installations of the various departments of the storehouse extension.

Structural Materials Laboratory

During the past year it became advisable to further subdivide the work of the laboratory and create a new department to take care of the testing of structural materials. This work had formerly been performed by the High-Tension and General Testing Laboratory, but since it was not related to the regular work of this department, being largely on a non-electrical nature, and as in the immediate future the demands of the Commission for this class of testing were expected to be considerable, it was decided that specialization in this field was warranted and a new department, called the Structural Materials Laboratory, was organized.

This new department is to take care of all tests and questions relating to the purely physical properties of the various materials of engineering, such as cement, aggregates and concrete, steel, iron and other metals, woods, oils, paints, etc., also all mechanical tests of clamps, wire, cable and various transmission line materials, tests of galvanizing and other rust-proofing, tests of water-proofing, heat insulating materials, wood preservatives and allied work. To this end the necessary equipment is being installed or will be installed in the near future.

Formerly the laboratory was equipped for the physical testing of cement and partially for the testing of sand and gravel. Since the creation of the new department additional apparatus is being intalled and the laboratory will shortly have a very full and complete equipment for both the above classes of tests. With the

additional apparatus soon to be installed the Commission will have one of the most completely equipped laboratories in this field in the Province, prepared to undertake all classes of physical testing and investigations on cement, concrete and concrete materials.

Since its inception this department has been mainly concerned with the studies of equipment and methods of testing for the work previously outlined. Besides this a certain amount of testing has been undertaken in connection with the present storehouse extension, the purchase of the Commission's transmission line hardware and other routine test work.

A preliminary report has been prepared covering the methods of testing, equipment and operation of a field laboratory to handle the necessary testing in connection with the large amount of concrete work involved in the New Niagara Power Development. The proposed field laboratory will be operated in connection with the permanent laboratory under the direction of this department and will involve the testing and inspection of the cement, sand, concrete, steel and other materials for this large undertaking. Preliminary to this work it is proposed to experiment extensively with a view of evolving the most suitable and economical methods of testing possible with the attainment of the object in view, also to make a complete study of the available concrete materials, their possibilities, limitations and drawbacks.

Photographic Laboratory

The equipment of this department and the scope of its work have been described in a previous report.

The work handled by the Department has so increased during the past year that an increase of staff has been necessary. During the year about 400 orders passed through the laboratory, adding over 500 new negatives to the files and over 20,000 prints of various sizes were made for the different departments of the Commission. A considerable amount of field work was done by the official photographer necessitating several trips to various points on the system. These trips covered such subjects as electric railway development, rural distribution of power, surveys for power sites, etc.

GENERAL ENGINEERING

WATERWORKS

Stratford

Gasoline Driven Centrifugal Pumps for Standby Purposes

During 1914 the question of providing pumping equipment to act as a standby to electric pumps in case of fire, as required by the Fire Underwriters, was taken up, and the Commission agreed to act as engineers for this work.

High speed gasoline engines for direct coupling to centrifugal pumps having been (at that time) recently tried in several places, their merits were investigated and it was decided that if a suitable reliable engine of this type could be found it would form an almost ideal standby, because of the small space occupied, comparatively light weight, low first cost, ease and readiness with which it could be started up, and the small amount of labour required.

After having settled on the capacity and head which the required pump should give, the Commission communicated with many manufacturers of high speed gasoline engines, or their representatives, in Great Britain and various European countries, as well as in Canada and the United States, and later issued specifications covering a complete pumping unit comprising a centrifugal pump mounted on a common bed-plate with, and direct connected to, a gasoline engine, some latitude being given with regard to pump capacity, head and speed.

Most of the firms, both in Europe and on this continent, which were asked to tender, expressed their inability to provide a suitable engine, owing either to the high speed asked for (1,200-1,500 r.p.m.) or horse power required (130-150 h.p.) or both.

The tender of the Storey Pump and Equipment Company, was finally recommended to the Waterworks' Commission of Stratford. This tender was for a bronze fitted, 3 stage, 8-inch horizontal centrifugal pump with horizontally-split casing, direct coupled to a 6 cylinder gasoline engine made by the Van Blerck Motor Company, of Munroe, Mich. The pump at a speed of 1,500 r.p.m. was guaranteed to be capable of delivering 1,000 Imp. g.p.m. of fresh water against a total head of 292 feet. The engine was guaranteed to develop 136 h.p. at a speed of 1,500 r.p.m., and to be capable of running continuously for not less than 10 hours at that speed, and at a speed of 1,700 r.p.m. for 2 hours continuously.

A governor was to be provided which would hold the speed steady to within plus or minus 3 per cent. between no load and full load, and which would prevent "hunting."

The consumption of gasoline was guaranteed not to exceed 0.66 Imp. pint per brake horse-power hour.

The Stratford Waterworks' Commissioners decided to purchase two of these pumps, and an order was placed for this number.

When the gasoline engines were ready at the maker's works, one of the Commission's engineers went over to witness the tests, which proved quite satisfactory, the guarantees being more than fulfilled.

The pumps also underwent rigid tests at the maker's works, and finally the completed units were tested.

Both pumping sets were then shipped to Stratford and erected. During this stage of the work air-starters were fitted on to the engines, operated by compressed

air. These starters comprise a small air compressor driven by the engine, an air tank and a selector valve.

The compressor fills the tank with air to a pressure of about 250 lbs. per square inch, and on starting the engine this compressed air is admitted in proper sequence to the cylinders, along with gasoline, by means of the selector valve; the engine is then started by the combined effect of the compressed air, and the combustion of the gasoline in the usual manner.

In connection with the provision of gasoline engines, the matter was taken up with the Canadian Fire Underwriters Association, and their views obtained as to the precautions required in view of the risk of fire; plans were later prepared and submitted to them; these received their approval, except in one or two minor features which were altered to comply with their wishes.

After erection these pumping units were submitted to further severe tests in Stratford, and found to fulfil the guarantees in all respects within the allowable limits of variation of plus or minus 2 per cent.

Since completion, the pumps have been utilized on several occasions in emergencies for giving domestic supply, and within a few months of installation had been found so satisfactory that the Stratford authorities entirely discarded their steam plant by taking it out altogether, and installed a small heating plant for use in winter.

There has been received from the Secretary of the Public Utility Commission of Stratford the following estimated comparison of standby service for steam and gasoline for one year, based on actual experience with the latter for about nine months.

	Steam	Gasoline	Saving
Fuel and Supplies.....	\$2,432.82	\$400.00	.....
Labour.....	2,460.00	1,800.00	.....
Repairs (estimated).....	365.00	50.00	.....
	<u>\$5,257.82</u>	<u>\$2,250.00</u>	<u>\$3,007.82</u>

The actual saving is probably a little less than that shown, as it is understood that the steam pumps were employed in pumping for domestic purposes to a greater extent than is the case with the gasoline pumps.

However, since the total cost of this plant will not much exceed \$10,000, it is evident that it forms a good investment for the city.

The two pumping sets, each of 1,000 Imp. g.p.m. capacity at 292 feet total head, occupy rather less space than that originally taken up by 1-1,750 Imp. g.p.m. steam pump together with its condenser, and the space occupied by the boilers, firing floor, coal storage space and smoke stack is available for other uses. Investigation shows that gasoline driven units such as these take up about one-tenth to one-fifteenth of the floor space required for equivalent steam plant. The extreme height of these sets does not exceed 3 feet 6 inches.

Since the pumps are required for standby purposes only, the wear and tear on them will be very small, and they should therefore last a long time; ordinarily they are only run about one hour or so a week each to make sure that everything is in good working condition.

For the same reason the fact that gasoline is very expensive compared with coal is of not great importance, as very little is actually used normally, and the high cost of operating merely during emergency does not therefore matter.

Elevated Steel Water Tank

During 1914 the question of conserving electric power by storing water, especially on peak load, came up for consideration and was referred to this Commission. The matter was gone into carefully, the final decision being that a tank of 500,000 Imperial gallons, elevated so as to give a pressure of 80 lbs. in the pump house, would make suitable provision for this purpose.

A site near the pump house was then chosen, investigation being made as to the suitability of the ground to carry so heavy a weight, that of the water alone being 2,500 tons.

Specifications for an elevated tank of steel, with alternatives for reinforced concrete, were then issued and tenders called for the work, eleven being received: eight of these were for steel and three for reinforced concrete structures.

Very careful attention was given to these tenders from the point of view of design, construction and appearance, as well as from that of the extent of the experience which the various tenderers had had in building such large structures.

After eliminating all other tenders for one reason or another, those of the Canadian Bridge and Iron Works and the Pittsburg Des Moines Steel Company, were the last two between whose bids a decision had to be made; the first named being actually awarded the contract on September 17th, 1915, for the erection of a 500,000 Imperial gallon steel tank, 39 feet 9 inches deep and 54 feet in diameter, elevated so that when full the water level would be 155 feet above the ground; the supports to consist of 8 legs constructed of steel, and the riser drum to be 6 feet in diameter.

This tank for its size is very shallow, having the special elliptical bottom designed by the Chicago Bridge and Iron Works, one advantage, of course, being that the water pressure varies only between small limits, while another is that the flat bottom acts as a diaphragm and takes care of the expansion and contraction of the riser drum. The large diameter of the riser drum obviates the need for a frost casing. The weight of steel in the whole of this structure is 250 tons, making a total weight on the foundations, when full of water, of 2,750 tons.

Special precautions were taken to insure that the fabrication of this structure should be carried out in Canada, and that Canadian labour should be employed to the fullest extent possible.

Specifications were also drawn up covering the concrete foundations. Tenders were called for on this work, and a contract was finally made with a local firm in Stratford for the construction of the foundations, and a valve chamber which was located at the foot of the tower.

These foundations had to be very massive, in the 8 footings for the tower legs and the footings for the 6-foot riser drum over 300 cubic yards of concrete were used.

At the foot of the tower it was necessary to build a large valve chamber to accommodate an electro-hydraulic valve and two ordinary gate valves. These three are all 16-inch valves.

The first named is operated from the pump house by turning a switch, which closes an electric circuit, thus actuating a small control valve which admits the water to one side or the other of a hydraulic piston, connected with the main valve, according to whether this valve is to be opened or closed. On receiving an alarm of fire the operator in the pump house can close the valve in the manner described, thereby shutting off the tank, when the water pressure can be immediately raised

to that required for fire purposes. The two hand operated gate valves are located one on either side of the electro-hydraulic valve for use in case of emergency or in the event of the last named valve needing repairs.

Drainage, ventilation and lighting of the valve chamber were also provided for.

The level of water in the tank is indicated on the side of the tank on a large vertical scale, marked in feet; the slider being actuated by a float in the tank. In the pump house the water level is read on the pressure gauge.

The tank has a balcony with a stout iron railing all around it, and access to this is gained by an iron ladder, which extends from the balcony to about 7 feet from the ground.

The whole structure received one shop coat and one field coat of graphite paint.

The tank is roofed over and may be entered by ascending the ladder (which reaches from the balcony to the roof) and climbing through a man-hole. This ladder is arranged to revolve around the whole tank, so as to give access to every portion of the sides and roof for inspection and painting.

Inside the tank at the bottom, in order to guard against the possibility of anyone falling down the riser drum, during construction, or at any future time, an iron grid is provided over the opening.

The total cost of this work amounted to about \$30,000.

The advantages of such an elevated tank are several:—

1. There is available at all times for domestic supply a considerable quantity of water at a pressure ranging from 80 to 63 lbs. per square inch.
2. Water at this pressure can be used in case of fire for a few minutes until proper fire pressure is available or possibly altogether for small fires.
3. It is possible to do all the pumping outside of peak load hours, thereby effecting considerable economy.
4. The pumping conditions generally, and the pressure at services are rendered more uniform, thereby permitting the use of smaller units, as otherwise the available pumping capacity must be at least equal to that of the water peak.

Niagara-on-the-Lake

At the beginning of 1916, the Commission was approached by the authorities of the town of Niagara-on-the-Lake, with a view to obtaining engineering advice in connection with their waterworks' pumping.

This work was taken up and after careful consideration of local conditions, specifications were issued and tenders called for two electrically driven centrifugal pumps.

Various tenders were received for these, the order finally going to the Storey Pump and Equipment Company, for 2 6-inch, 2-stage, bronze-fitted, centrifugal pumps, each capable of delivering 600 Imp. g.p.m. of fresh water against a total head of 180 feet, and each direct coupled to a Crocker Wheeler, 50 h.p., three-phase, 25-cycle, 2,200-volt, 1,500 r.p.m., squirrel cage induction motor.

The pumps when ready at the maker's works were tested in the presence of one of the Commission's engineers, but failed to fulfil the guarantees regarding efficiency, and the Commission therefore refused to accept them. It was then arranged that the makers should build two new pumps of a somewhat different pattern. This was done very expeditiously, and the new pumps, having proved satisfactory under test at the maker's works, were accepted.



Elevated Water Tower at Stratford Municipal Waterworks

Very careful tests were also witnessed at the maker's works on the motors, which were found to properly meet the guarantees.

The completed units were then erected at Niagara-on-the-Lake, and have been running satisfactorily ever since, i.e. about six months.

Camp Borden

During the negotiations for the supply of electric power to Camp Borden, the matter of pumping plant was taken up with the Commission by the Military Authorities, as such plant was required very urgently.

The conditions having been looked into, steps were immediately taken to secure the necessary pumps, motors and auxiliary equipment. It was found possible to obtain from the Storey Pump and Equipment Company, two centrifugal pumps which they had in stock, and which would be suitable if driven at a speed of about 1,800 r.p.m.

Two 150 h.p., 2,200-volt, three-phase, 25-cycle, 750 r.p.m. motors were also procured, one from the Canadian General Electric Company, and the other from the Canadian Westinghouse Company.

The essential feature of this work was that it be carried out in the shortest possible time, and although it would have been preferable to use motors direct coupled to the pumps, it was impossible to do so, owing to the limited time available, the pumps were therefore arranged to be belt driven.

The necessary outboard bearings and pulleys were on this account obtained from the pump makers; suitable valves and pipe fittings were purchased, and the equipment was all shipped to Camp Borden and erected there.

This plant was put into operation within one month of the date on which the Commission took the matter up.

Palmerston

At the request of the town authorities, specifications were issued in July for a vertical electrically driven centrifugal pump, capable of delivering 300 Imp. g.p.m. of fresh water against a total head of 150 feet. The pump was to be suspended about 14 feet below the motor in a steel framework.

After consideration of the various tenders received, an order for this equipment was placed with the Canadian Fairbanks-Morse Company, by the town officials on the recommendations of the Commission. It has already been tested and found satisfactory at the maker's works, and instructions have been given for immediate delivery to Palmerston. The pump will be erected in a well about 6 feet diameter and 35 feet deep, close to the pump house.

Tavistock

During August of this year, the subject of pumping was brought before the Commission's engineers by the Reeve, asking for prices on an electrically driven pump for domestic purposes.

After having ascertained the local requirements, and upon instructions from the town, a 4-inch x 4-inch 60 Imp. g.p.m. Luitwieler pump to discharge against a head of from 65 to 104 lbs. per square inch, geared to a single-phase, 220-volt, 25-cycle motor, was purchased from the General Machinery Company; the motor was equipped with an automatic device, whereby the motor is started and stopped automatically according to whether the tank is empty or full.

Ridgetown

At the request of the Waterworks' Commission in Ridgetown, one of the Commission's engineers witnessed a test carried out on two triplex 6-inch x 8-inch single acting pumps supplied by the Canadian Fairbanks-Morse Company, and designed to deliver 104 Imp. g.p.m. at a speed of 43 r.p.m. against a head of 125 lbs. These pumps are geared and each is belt driven from a 15 h.p. 750 r.p.m. 550 volt, three-phase, 25-cycle motor.

The test results were only approximate owing to the character of the testing equipment available, but were sufficient to enable the Commission to inform the town authorities that the plant as a whole was quite satisfactory, and that it was capable of doing the work required of it.

Kingston, Chesley, Listowel, etc.

Estimates, reports and preliminary engineering work have also been carried out in connection with Waterworks' pumping problems for the following:—

Kingston, Chesley, Listowel, Preston, Lindsay, Exeter.

Progress has also been made in connection with work at Goderich and Galt, where certain revisions of existing plant were necessary. A contract for a motor for Galt has been arranged, and this has been installed. At Goderich a contract for a new pump has been let, which it is expected will be running early in 1917.

INSPECTION OF MATERIALS

A good deal of inspection work has been carried out during the year.

Insulators for voltages of from 4,000 to 110,000 volts, and for telephone work, numbering nearly 100,000 have been inspected.

Two carloads each of insulator pins and hardware, as well as various sizes of copper, steel and aluminum wire and cable exceeding a total weight of 320 tons, were also inspected within the period.

NITROGEN FIXATION

A considerable amount of investigation has been made during the year in regard to the fixation of atmospheric nitrogen, more especially by electrical processes, with a view to ascertaining the possibilities of developing a useful "off-peak" load.

Nitrogen is required in enormous quantities, in particular, for two purposes, viz:—as a fertilizing agent for crops and plant life generally, and also for the manufacture of explosives.

The largest natural source of nitrogen in a useful form is the great nitrate beds of Chili, and as an indication of the extent to which the demand throughout the world has grown, it is of interest to note that, while in the year 1830 about 1,000 tons of nitrate were exported from Chili, the quantity exported in 1912 was in the neighbourhood of $2\frac{1}{2}$ million tons.

There are some other sources of nitrogen naturally available in the world, but the total visible supplies are comparatively limited, and scientists have for several years been anxious to find some source whence the element nitrogen could be made commercially available.

Electrical methods of obtaining this element in a useful chemically-combined form, while not the only ones which have been developed, have been brought to a point where they are of great commercial importance, as the cost of thus producing nitrogen compounds is competitive with the cost of Chilean nitrate, this latter, up to the present, controlling the market prices.

Plants for the fixation of atmospheric nitrogen, on a large scale, by electric methods, are in operation, under construction, or projected, in Norway, Switzerland, Spain, Germany, Italy, India, the United States, Canada, Japan, and possibly some other countries.

In all the countries named water power is, or will be, the source of energy for this rapidly growing industry, with the exception of Germany, where poor grade coal is to be used in generating electric power. It is probable that there are now some half million or more horse-power in use throughout the world for obtaining nitrate from the air electrically, the bulk of this being in Norway, which is favourably situated in respect both of cheap water power and available markets.

The electric methods which have been devised so far for obtaining nitrogen may be classified under two main headings, viz:—the electric arc process and the cyanamide process.

The former, comparatively, takes a good deal of energy, and since the cost of water power in Canada is relatively high, it is hardly probable that any of the arc processes would be a commercial success in this country, unless the production per unit quantity of combined nitrogen per kilowatt hour can be appreciably increased over and above what has hitherto been realized.

The cyanamide process, which is that in use at Niagara Falls, Ontario, has proved financially practicable there, and probably can be made so in other parts of Canada; since the raw materials are the air we breathe, coke, and lime, there are doubtless a number of points in Ontario where the obtaining of these essentials in sufficient quantity would be comparatively easy.

The chief points to be considered in connection with the commercial production of nitrogen compounds are—

1. The cost of electric power at the point where it is to be used.
2. The cost of transportation for the raw materials.
3. The size and availability of the markets.

The Canadian market for these compounds in normal times, at least, will be practically limited to the demand for fertilizer products, at present this is of limited dimensions, but is likely to grow at an increasingly rapid rate.

A good deal of activity has been evident in the United States in recent months in connection with nitrogen fixation. During the summer a number of meetings were held in Washington, D.C., in connection with nitrogen fixation and water power development. Some of these meetings were attended by a representative of the Commission. A great many records were examined at the same time.

Owing to the war, and the great shortage of power now being experienced, it is not possible to do more than keep in touch with the trend of events regarding this subject.

ELECTRIC FURNACES

During the year the Commission has been investigating modern electric furnace practice, and the possibilities of this load in Ontario. The results of investigation so far show that where power is plentiful and reasonable in price the electric steel furnace is entirely practical.

The increasing number of these furnaces in the Province confirms this belief, and it is anticipated that the electric furnace will not only be applied to the production of fine steels, but that it will even compete with the open hearth furnace.

There is also every indication that electric smelting for iron, copper and other ores will be an important factor in the mining districts of the Province.

The high prices ruling for coke and coal and for steel products during this year, makes the electric furnace very attractive, and there is every indication that electric steel production in this Province will grow rapidly during the next year or two.

The electrical production of such products as calcium carbide, carborundum and other substances requiring high heat, is growing, and in this Province such production will undoubtedly take an increasing share of the surplus water powers.

RULES AND REGULATIONS

The drafting of rules and regulations governing outside overhead work has been in hand during the year, considerable progress having been made. These are now at a stage where they are being considered in detail by the Commission's engineers in conference, and it is intended later to submit a revised draft to electrical engineers outside the Commission's staff, for criticism and such further revision as may appear to be necessary.

INDEX

A		Page
Acton—Municipal Work	161	
Acts	1	
Administration Building	95	
Agreements	94	
Almonte—Municipal Work	173	
Almonte—Ornamental Street Light- ing	189	
Alton—Municipal Work	169-170	
Amherstburg—Ornamental Street Lighting	190	
Arthur—Municipal Work	169	
Artemesia Township—Municipal Work	170	
Aultsville—Municipal Work	174	
B		
Baden—Distributing Station	103	
Beaverton—Distributing Station ..	112	
Beaverton—Municipal Work	174	
Big Chute—Power House	112	
Blenheim—Distributing Station ..	110	
Blenheim—Ornamental Street Light- ing	189	
Bothwell—Municipal Work	161	
Brampton—Municipal Station	109	
Brampton—Municipal Work	161	
Bracebridge—Municipal Work	174	
Brant—Transformer Station	109	
Brock Township—Municipal Work ..	174	
Brockville—Municipal Work	174	
Brownsville—Municipal Work	162	
Burford—Municipal Work	161	
C		
Camp Borden—Municipal Station ..	113	
Camp Borden—Municipal Work	171	
Camp Borden—Waterworks Pumping	205	
Cannington—Distributing Station ..	112	
Cannington—Municipal Work	174	
Central Ontario Power Act	89	
Central Ontario System—Operation	151	
Central Ontario System—Description of Lines	132-133	
Central Prison Farm, Substation	102	
Chatham—Ornamental Street Light- ing	190	
Chatham—Municipal Work	161	
Chatsworth—Distributing Station ..	114	
Chesley—Distributing Station	114	
Chesley—Municipal Work	169	
Chesley—Waterworks Pumping	206	
Clinton—Municipal Work	161	
Cobden—Municipal Generating Sta- tion	97	
Cobden—Municipal Work	174	
Cobden—Ornamental Street Light- ing	189	
Cobourg—Municipal Work	182	
Cobourg—Ornamental Street Light- ing	190	
Coldwater—Distributing Station ...	113	
Collingwood—Distributing Station ..	112	
Cooksville—Transformer Station ...	108	
Cornwall—Municipal Work	175	
Crossings	94	
D		
Dereham Township—Municipal Work	162	
Dundalk—Distributing Station	115	
Dundas-Toronto—Surveys	95	
Dunnville—Municipal Work	162	
Dunnville—Ornamental Street Light- ing	190	
Durham—Distributing Station	115	
E		
East Luther Township—Municipal Work	171	
Essex—Transformer Station	111	
Etobicoke—Distributing Station ...	108	
Eugenia—Generating Station	113	
Eugenia—Operation	148	
Eugenia—Description of Lines	130-31	
Exeter—Distributing Station .....	..
Exeter—Ornamental Street Lighting	190	
Exeter—Waterworks Pumping	206	
F		
Forest—Distributing Station	110	
G		
Galt—Waterworks Commission	102	
Galt—Municipal Work	162	
Galt—Waterworks Pumping	206	
Gamebridge—Municipal Work	175	
Goderich—Waterworks Pumping ...	206	
Grand Valley—Distributing Station ..	116	
Grand Valley—Municipal Work	169	
Grantham Township—Municipal Work	162	
Granton—Feeder	101	
Gravenhurst—Municipal Work	175	
Guelph—Transformer Station	102	
Guelph—Ornamental Street Lighting	190	
H		
Hamilton—Municipal Work	162	
Hamilton—Municipal Underground Construction	191	
Hanover—Distributing Station	115	
Hanover—Municipal Work	169-171	
Harriston—Distributing Station ...	105	
Hespeler—Municipal Work	162	
Huntsville—Distributing Station ...	118	
Huntsville—Municipal Work	175	
Huntsville—Ornamental Street Light- ing	190	
Hydro-Electric Railway Act	73	

I

	Page
Ingersoll—Municipal Work	163
Ingersoll—Ornamental Street Light- ing	190
Iroquois—Municipal Work	276

K

Kemptville—Municipal Work	176
Kent—Transformer Station	109
Kilsyth—Distributing Station	117
Kingston—Municipal Station	118
Kingston—Municipal Work	176
Kingston—Ornamental Street Light- ing	190
Kingston—Waterworks Pumping	206
Kitchener—Transformer Station ...	103

L

Lindsay—Waterworks Pumping	206
Listowel—Distributing Station	104
Listowel—Waterworks Pumping	206
London—Utilities Commission	101
London—Railway Commission	101
London—Municipal Work	163
London Township—Municipal Work ..	163
Lucan—Distributing Station	101

M

Markdale—Municipal Station	114
Markdale—Municipal Work	169
Meaford—Municipal Work	169
Merrickville—Municipal Work	176
Mille Roches—Municipal Work	176
Milverton—Distributing Station	105
Mimico—Distributing Station	108
Mitchell—Municipal Station	104
Mitchell—Municipal Work	163
Mount Forest—Distributing Station ..	115
Morrisburg—Municipal Work	176
Muskoka System—Operation	153
Muskoka System—Description of Lines	132-33

N

New Toronto—Municipal Work	163
Niagara—Development	96
Niagara Falls—Transformer Station ..	97
Niagara Falls—Distributing Station ..	99
Niagara-on-the-Lake—Municipal Sta- tion	99
Niagara-on-the-Lake—Municipal Work ..	164
Niagara-on-the-Lake — Waterworks Pumping	204-5
Niagara System—Operation	140
Niagara System—Description of Lines	124-25-26-27-28-29
Niagara Falls—Municipal Work	163
Nipissing—Municipal Work	183
North Bay—Ornamental Street Light- ing	190
North Bay—Municipal Work	177
North Norwich Township—Municipal Work	164
Northumberland Pulp Mill	182-83

Page

Norwich—Ornamental Street Light- ing	190
Norwich—Municipal Work	164

O

Ontario Niagara Development Act ..	65
Omeme—Municipal Work	177
Ornamental Street Lighting	189
Orangeville—Distributing Station ..	116
Orillia—Municipal Work	172
Oshawa—Municipal Work	183
Ottawa—Municipal Work	177
Owen Sound—Distributing Station ..	114
Owen Sound—Municipal Work	171
Owen Sound—Municipal Under- ground Construction	191

P

Palmerston—Distributing Station ..	105
Palmerston—Waterworks Pumping..	205
Paris—Municipal Station	109
Parry Sound—Municipal Work	177
Peterborough—Public Utilities Com- mission	96
Petrolia—Municipal Work	164
Peterborough—Municipal Work	183
Peterborough Radial Railway	182
Petrolia—Distributing Station	110
Petrolia—Ornamental Street Light- ing	190
Port Arthur System—Operation	154
Port Arthur—Municipal Work	165
Port Elgin—Municipal Work	169
Port McNichol—Distributing Station ..	112
Port McNichol—Municipal Work	172
Port Robinson—Distributing Station ..	99
Powassan—Distributing Station	113
Power Commission Act	1
Prescott—Municipal Work	177
Preston—Municipal Work	165
Preston—Transformer Station	102
Preston—Waterworks Pumping	206

R

Railway Act—Hydro-Electric	73
Renfrew—Municipal Work	177
Ridgetown—Distributing Station	109
Ridgetown—Municipal Work	165
Ridgetown—Ornamental Street Light- ing	190
Ridgetown—Waterworks Pumping ..	206
Right of Way—High Tension Lines.	94
Right of Way—Low Tension Lines..	94
Rural Power—Municipal Work	187-88

S

Sarnia—Municipal Station	110
Sarnia—Municipal Work	165
Sarnia—Ornamental Street Lighting.	190
Scarboro Township—Municipal Work ..	165
Seaforth—Municipal Station	104
Severn System—Description of Lines 130-31	
Severn System—Operation	146

	Page
Shelbourne—Distributing Station ..	115
Smith's Falls—Municipal Work	178
South Falls—Generating Station	117
Southampton—Municipal Work	169
South Norwich Township—Municipal Work	164
Springford—Municipal Work	162
Stamford Township—Municipal Work	166
Storehouse, Toronto—Extension	96
Stratford—Municipal Station	103
Stratford—Municipal Work	166
Stratford—Transformer Station	103
Stratford—Waterworks Pumping	201-2-3-4
St. Catharines—Municipal Work ..	166
St. Catharines—Ornamental Street Lighting	190
St. Lawrence System—Description of Lines	130-31
St. Lawrence System—Operation ..	155
St. Mary's—Municipal Work	166
St. Mary's—Transformer Station ..	105
St. Mary's—Portland Cement Co.—Distributing Station	105
St. Thomas—Municipal Station	106
St. Thomas—Municipal Underground Construction	191
St. Thomas—Municipal Work	166
St. Thomas—Transformer Station ..	106
Sunderland—Municipal Work	178

T

Tavistock—Distributing Station	104
Tavistock—Municipal Work	167
Tavistock—Waterworks Pumping ..	205
Toronto-Dundas—Surveys	95
Toronto—Municipal Work	167
Toronto Township—Municipal Work ..	167
Tillsonburg—Municipal Work ..	162-167

	Page
Transformers—Capacities installed or ordered for Commission's Stations	119-120-21
Transformers—Station transformers ordered for municipalities and Commission during 1916	122
Transmission Lines—Low Tension..	123

U

Underground Construction	191
--------------------------------	-----

W

Walkerville—Municipal Substation..	111
Wallaceburg—Municipal Work	167
Wasdell Falls—Generating Station ..	111
Wasdell Falls—Description of Lines	130-31
Wasdell Falls—Parallel operation with Eugenia and Severn	151
Wasdell System—Operation	150
Washago—Municipal Work	178
Watford—Municipal Work	168
Water Powers Regulation Act	68
Waterloo—Municipal Work	168
Waterloo Township—Municipal Work ..	168
Welland—Municipal Station	99
Welland—Municipal Work	168
West Lorne—Distributing Station ..	108
Weston—Municipal Station	109
Weston—Municipal Work	168
Windsor—Municipal Work	168
Windsor—Ornamental Street Lighting	190
Woodstock—Transformer Station ...	106
Winchester—Municipal Work	173

Y

York—Transformer Station	111
York Township—Municipal Work ..	168

Ninth Annual Report
OF THE
HYDRO-ELECTRIC POWER
COMMISSION

OF THE
PROVINCE OF ONTARIO
FOR THE YEAR ENDED OCTOBER 31st
1916

VOLUME II.

PRINTED BY ORDER OF
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1917

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TORONTO

To His Honour, COLONEL SIR JOHN HENDRIE, K.C.M.G., C.V.O.,

Lieutenant-Governor of Ontario.

MAY IT PLEASE YOUR HONOUR:

The undersigned has the honour to present to Your Honour the second volume of the Ninth Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1916.

Respectfully submitted,

ADAM BECK,

Chairman.

TORONTO, ONT., February 17th, 1917.

COLONEL SIR ADAM BECK, K.B., LL.D.,

Chairman, Hydro-Electric Power Commission,

Toronto, Ont.

SIR,—I have the honour to transmit herewith the second volume of the Ninth Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1916.

I have the honour to be,

Sir,

Your obedient servant,

W. W. POPE,

Secretary.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

COLONEL SIR ADAM BECK, K.B., LL.D., London, Chairman.

HON. I. B. LUCAS, M.P.P., Markdale, Commissioner.

COLONEL W. K. McNAUGHT, C.M.G., Toronto, Commissioner.

W. W. POPE, Secretary.

F. A. GABY, Chief Engineer.

CONTENTS

OPERATION OF THE SYSTEMS.

Niagara System:	Page
Notes on Operation	1
Curve Showing Monthly Increase of Power Loads of Municipalities	1
Capital Investment	4
Expenditures	4
Receipts and Disbursements	4
Comparative Load Records of Municipalities	5
Municipalities Connected to Niagara System during the past year	6
Severn System:	
Notes on Operation	7
Comparative Load Records of Municipalities	8
Municipalities Connected to Severn System during the past year	8
Capital Investment	8
Revenue and Expenditures	8
Eugenia System:	
Notes on Operation	9
Comparative Load Records of Municipalities	9
Capital Investment	10
Revenue and Expenditures	10
Wasdells System:	
Notes on Operation	11
Comparative Load Records of Municipalities	11
Capital Investment	11
Revenue and Expenditures	11
Typical Daily Load Curves, Severn, Eugenia and Wasdells Generating Stations Operating in Parallel, October, 1916	11
Parallel Operation of the Severn, Eugenia and Wasdells Systems	12
Central Ontario System:	
Notes on Operation	12
Power Generated	13
Load Records of Municipalities, October, 1916	13
Curve Showing Weekly System Peaks	13
Muskoka System:	
Notes on Operation	14
Port Arthur System:	
Notes on Operation	15
Capital Investment	15
Operation and Maintenance Expenses	15
Financial Statement of Operation	15

St. Lawrence System:	Page
Notes on Operation	16
Comparative Load Records of Municipalities	16
Capital Investment	16
Revenue and Expenditures	16
Total Capital Investment	17
Provincial Expenditures	19
Balance Sheet	20
 Municipal Accounts	
Outline of work of Municipal Accounts Department, with comparative consolidated balance sheets and comparative consolidated operating reports for years 1912, 1913, 1914, 1915 and 1916	21
 Statement:	
A. Comparative Balance Sheets, 1914 and 1915	26
Total Plant Cost.	
Total Investment.	
Debt Balance.	
Reserves.	
Percentage of Net Debt to Total Assets.	
 B. Condensed Operating or Revenue and Expense Reports for 1916	61
Population.	
Plant Cost.	
Balance Construction Debt.	
Operation, Maintenance and Administration.	
Fixed Charges, Debenture Payments and Interest.	
Total Operation.	
Total Revenue.	
Surplus.	
Depreciation Charge.	
Surplus, Less Depreciation Charge.	
Number of Consumers.	
Percentage of Consumers to Population.	
Horsepower Peak Taken in December, 1916.	
C. Comparative Detailed Operating Reports for 1913, 1914, 1915 and 1916	68
D. Comparative Statement of Revenue, Number of Consumers, Total Consumption, Average Monthly Consumption per Consumer, Average Monthly Bill and Net Cost per kw-hr for years 1912, 1913, 1914, 1915 and 1916	113
E. Street Light Installations	124
F. Cost of Power and Selling Rates	Folders
G. Lighting Rates in Effect in all Municipalities in 1912, 1913, 1914, 1915, 1916 and Suggested Rates for 1917	Folders

OPERATION OF THE SYSTEMS

NIAGARA SYSTEM

The operation of the Niagara System for the year 1916, was attended with gratifying success. In no other year, and especially since the war commenced, have the lines and apparatus of this system been called upon for such extraordinary duty. This condition was occasioned by the rapid recovery of industry together with the enormous development of the manufacture of war munitions in Canada.

During the months of November to April, inclusive, and from July to October, power was purchased for transformation and transmission from two, and indirectly three sources, the supplying plants being linked together by the Commission's Transforming Station at Niagara Falls. On April 30th, the temporary contract with the Toronto Power Company expired, and from this date until July 26th, when the first generating unit from the Canadian Niagara Power Company was connected, the total load of the Niagara System was carried by the Ontario Power Company. On August 21st, a second unit at the Canadian Niagara Power Company's Plant was paralleled with the first, and from this date until the end of October, the amount of power available from this company amounted to approximately 25,000 horse-power. As these generating stations were operating at maximum capacity, extreme caution was necessarily exercised in the operation of the system in order to preserve equilibrium at all times. Due credit is extended to the Ontario Power Company for the satisfactory service received during the year.

Electrical storms during the past year were much more frequent and severe than in previous years. The Niagara System was subjected to these storms on sixty different days. On eight days these storms traversed practically the entire system, and were particularly severe. The balance of the storms traversed only portions of the system, mainly in the Niagara Peninsula, Preston, Stratford and Chatham Districts, and were more or less severe. No total system interruption occurred from lightning causes during the summer, and when it is considered that the Commission has in operation approximately 1,200 miles of high and low tension lines overstretching a strip of Ontario approximately 215 miles long and averaging 60 miles wide, all lines being subjected to the accumulation of electrical discharges, which must be dissipated by passage to ground, the efficiency of the protective apparatus is strikingly evident.

Work of a special nature carried out by the Line Maintenance Department, and required by reason of the rapid increase of load, included the erection of a temporary 12,000 volt double circuit pole line of No. 4/0 copper conductor between the power house of the Canadian Niagara Company's station and a point (on the present line between the Hydro and Toronto Power Company Transforming Stations) approximately 1,800 feet south of the Commission's station. Both circuits of this pole line are still in service pending the installation of the balance of the underground feeders to the Canadian Niagara Power Company's plant.

The erection of a fourth No. 4/0 copper, three-phase circuit 15.5 miles long, on the 46,000 volt tower line between Niagara Falls and Welland was completed and placed in operation.

The single or three-phase circuit of No. 2 aluminum between the High Tension station and the Municipal Station at Dundas was replaced with a double circuit of No. 4 copper. Two 13,200 volt air break switches were erected in these

lines at the entrance to the John Bertram and Sons Foundry, and also near the Dundas Municipal Station for the control of the line of the village of Lynden. The wood pole line from the Dundas High Tension to the City of Hamilton, which was replaced by a steel tower line during the summer of 1915, was taken down, and the material placed in stock.

Short stretches of single circuit 26,400 volt lines were constructed to supply the Lake Erie and Northern Railway Company's sub-stations at Brantford and Simcoe, from the outgoing circuits of Brant High Tension Station. This work also included the erection of telephone lines and instruments, and the installation of an air break switch at the Company's Simcoe sub-station.

The wood pole Low Tension Line entrances at London and St. Thomas, and at the Weston Municipal sub-station were remodeled to accommodate new lines erected in these districts. In view of the many new customers added in the Stratford District, and the length of line necessary to serve them, it has been decided to raise the transmission voltage in this district from 13,200 to 26,400. To this end considerable re-arranging of the power and telephone lines was carried out in preparation for this change. For sectionalizing purposes two air break switches were erected at Mitchell in the double circuit line between Stratford and Seaforth. The telephone line between Stratford and Sebringville Junction was doubled by the erection of a circuit of No. 9 iron wire.

Some re-location of the 13,200 volt line feeding the Mimico Distribution Station from the Cooksville High Tension Station was necessary, due to the construction of the Toronto-Hamilton Highway. The portion of line affected extended from Port Credit to New Toronto.

A twenty-five "pair" lead covered telephone cable approximately 13,500 feet long, was installed between the High Tension Station and the Commission's new office building at Toronto. The cable was laid in the Toronto Hydro-Electric System duct line to the corner of Queen and William Streets and from thence to the office building on the concrete poles.

Few failures of any of the electrical or mechanical equipment of the High Tension stations occurred during the year. As the Commission, in common with other enterprises in Canada, was severely handicapped in obtaining delivery on additional apparatus required to cope with the abnormal demand for power, the present equipment in some of the stations was subjected to overload for short periods, but without any depreciating results. The difficulty, mentioned above was partially met by the transfer, where feasible, of transformers from one station to another. One of the more important changes of this nature was the transfer of two 750 kv-a transformers from Guelph to the St. Thomas station.

The Commission now employs a staff of nine highly trained meter experts whose regular duties consist of the periodic calibration and adjustment of the various types of graphic recording and indicating instruments located in the Commission's stations.

These men also attend to the setting and adjustment of all relays used to protect the Commission's lines and equipment.

Considerable time has been spent in perfecting refinements in connection with the measurement of power, which has been to a great extent apparently considered unnecessary heretofore by the majority of other organizations. These refinements extend from the periodic comparison of the Commission's portable standard meters with ultimate standards to the determination of the characteristics of instrument transformers of various types.

CURVE SHOWING MONTHLY INCREASE OF POWER LOAD OF MUNICIPALITIES NIAGARA SYSTEM OCT. 1910 to OCT. 1916

H. E. P. C.
ONTARIO

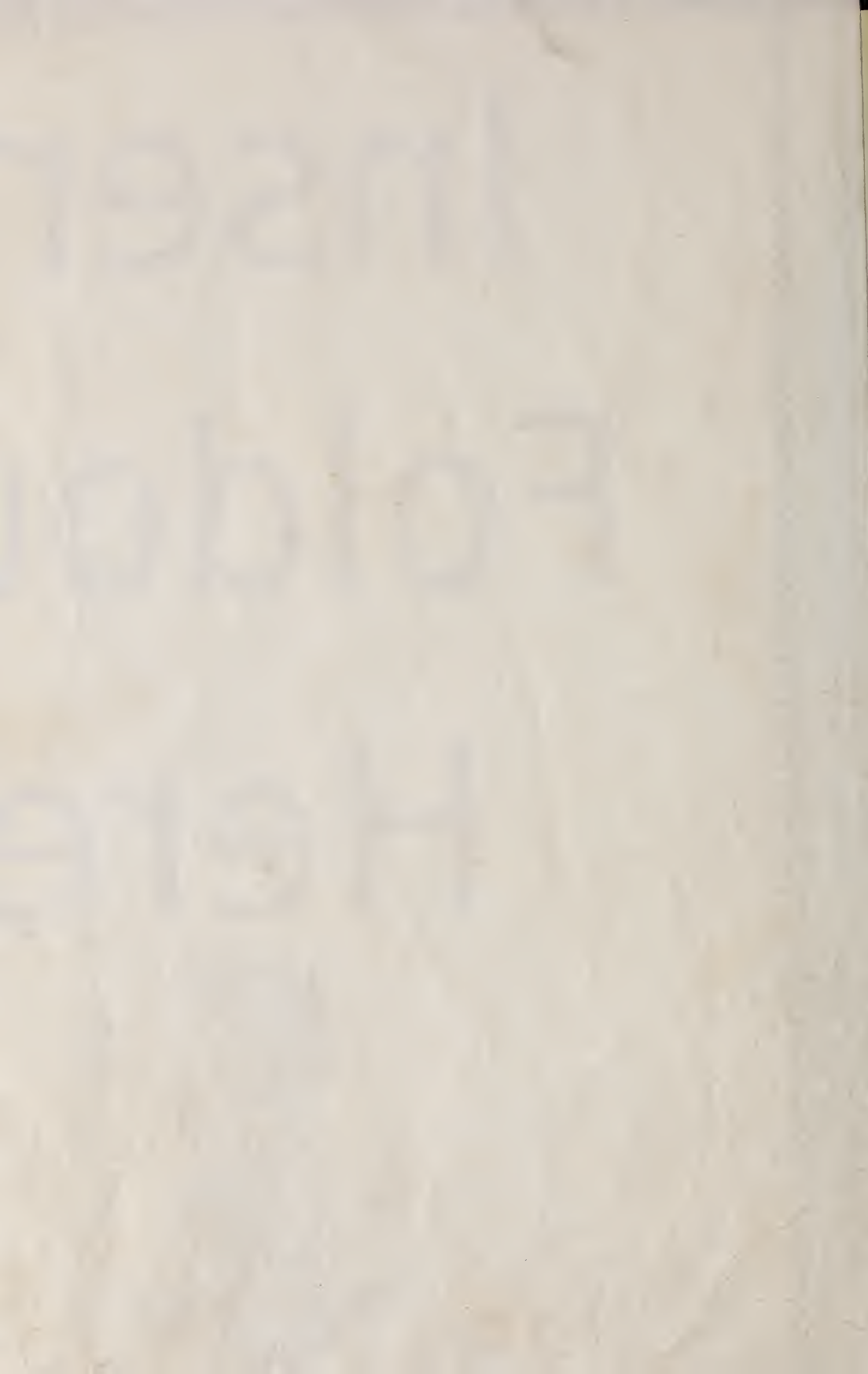
Horse-Power

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Horse-Power

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1910 Oct. Nov. Dec. 1911 Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. 1912 Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. 1913 Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. 1914 Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. 1915 Jan. Feb. Mar. April May June July Aug. Sept. Oct. Nov. Dec. 1916 Jan. Feb. Mar. April May June July Aug. Sept. Oct.



The services of the meter inspectors may also be requisitioned by any of the Commission's customers to inspect or adjust metering and relay equipment, or to conduct special measurements of any loads with regard to which the customer is desirous of obtaining particular information.

A long felt want was realized in the erection of the storehouses on the High Tension Station ground during the summer. These buildings will accommodate maintenance materials of a bulky nature. This work, together with the building of suitable approaches, was done under the supervision of the operators. Outside lights surmounting concrete poles were installed at Dundas, London and Kent High Tension Stations, with pleasing effect. Considerable improvement in appearance was accomplished in grading the grounds surrounding the High Tension Stations, and re-surfacing of the roads through the grounds from the highway.

A concrete roadway approximately 300 feet long and 6 inches thick, was laid across the flats at Preston, from the fair grounds to the Hydro-Electric Power Commission's Property. It is expected that this roadway will be unaffected by the heavy spring floods in this vicinity, which previously rendered impassable the original gravel topped roadway. An increase was made in the supply of cooling water for this station by the sinking of a well just outside the station, and the installation of a deep well pump for pumping the water directly into the cooling system. The supply originally obtained from the small creek in the flats had latterly become inadequate.

The tables given below show the load demands of the various municipalities as well as the increase during the year.

The plotted curve on another page shows the monthly increase in the load supplied from October, 1910, to October, 1916.

NIAGARA SYSTEM

Capital Investments of the Niagara System in operation at October 31st, 1916:

Right-of-Way	\$1,034,920 58
Steel Tower Transmission Lines	3,403,585 05
Telephone Lines	129,706 69
Relay System Lines	54,537 32
Conduit System (Ontario Power Co. to Niagara Station)	96,698 64
Wood Pole Lines	1,785,208 01
Transformer Stations	2,797,209 61
Distributing Stations	221,130 02
Total Operating Capital	\$9,522,995 92

Total expenditures in connection with the operation and maintenance of Niagara System for the Fiscal year 1915-16:

Operators' Salaries and Expenses, including Supplies	\$92,521 66
Maintenance of Steel Tower Lines	68,792 04
" Telephone and Relay Lines	15,422 41
" Low Tension Lines	20,350 09
" Transformer Stations	68,883 54
" Distributing Stations	7,514 28
Administration	44,811 77
	<hr/>
Interest on Invested Capital	\$371,404 94
Cost of Power at Niagara Falls	997,257 60
	<hr/>
	1,368,662 54

Summary of Financial Statement of the Niagara System operation for fiscal year 1915-16:

Receipts

Power delivered, including charges for Administration, General Expense, Operation, Maintenance and Interest	\$2,038,792 32
---	----------------

Disbursements

Power purchased, including losses in Transmission and Transformation, Administration, General Expense, Operation, Maintenance and Interest	<hr/>
	1,686,958 33
Surplus applicable to Sinking Fund and Depreciation Reserve Account	\$351,833 99

Municipality	Load in H.P. Oct., 1915.	Load in H.P. Oct., 1916.	Increase in H.P.
Toronto.....	32,748	38,465	5,717
Dundas.....	362	548	186
Hamilton.....	7,694.5	8,562	867.5
Waterdown.....	63	71	8
Caledonia.....	40.2	55	14.8
Hagersville.....	106	97.8	.....
London.....	5,971.5	7,359	1,377.5
Thorndale.....	28.4	34.8	6.4
Thamesford.....	19.3	26.5	7.2
Guelph.....	1,954.5	2,549.5	595
Ontario Agricultural College.....	153	160	7
Central Prison Farm.....	203.5	203.5	.....
Rockwood.....	34.2	11.9	.....
Georgetown.....	266.5	300	33.5
Acton.....	84.5	70.3	.....
Preston.....	973	1,149	166
Galt.....	1,602	2,285.5	683.5
Hespeler.....	368.5	450.4	81.9
Breslau.....	21.5	30	8.5
Kitchener.....	2,285.5	3,262	976.5
Waterloo.....	717	815	98
Elmira.....	91	109.9	18.9
New Hamburg.....	84.5	76.4	.....
Baden.....	157	196.5	39.5
Stratford.....	1,179.5	1,448	268.5
Mitchell.....	123.5	148.8	25.3
Seaforth.....	275	387.4	112.4
Clinton.....	98	101.8	3.8
Goderich.....	217	214.5	.....
St. Mary's.....	339	434.3	95.3
Woodstock.....	1,048	1,170	122
Ingersoll.....	740	792	52
Tillsonburg.....	233	242.6	9.6
Norwich.....	100.5	171.6	71.1
Beachville.....	132.5	96.5	.....
St. Thomas.....	1,658.5	2,011	352.5
Port Stanley.....	68.5	75	6.5
Brantford.....	1,552.5	1,783	230.5
Paris.....	381	398	17
Port Credit.....	57.5	59.6	2.1
Weston.....	178.5	197	16.5
Brampton.....	539	656.8	117.8
Milton.....	287	355	68
Mimico.....	127.5	156.1	28.6
Mimico Asylum.....	35	31.5	.....
Prov. Brick Yard.....	171	136	.....
New Toronto.....	80.5	291	210.5
Toronto Township.....	62.5	99.1	36.6
Cooksville.....	23	22.7	.....
Dixie.....	216	1,502.6	286.6
Windsor.....	777.5	1,576.5	799
Walkerville.....	51.6	77.7	26.1
Elora.....	68.5	92.5	24
Fergus.....	3,038.5	5,626	2,587.5
Welland.....	2,158.5	2,433	274.5
St. Catharines.....	104.5	79	.....
Port Dalhousie.....	143.5	203.7	60.2
Strathroy.....	18	10.9	.....
Drumbo.....	32.2	57.6	25.4
Plattsville.....	32.2	76.4	44.2
Woodbridge.....	35.5	36.2	.7
Ayr.....	9.8	10.4	.6
Princeton.....	25	28.1	3.1
Embro.....	431.5	509.4	67.9
Chatham.....			

Municipality.	Load in H.P. Oct., 1915.	Load in H.P. Oct., 1916.	Increase in H.P.
Lucan	33.5	30.2	.....
Bolton	34.8	95.2	60.4
Mount Brydges	26	26.8	.8
Wallaceburg	177	277.5	100.5
Delaware	7.2	8.9	1.7
Tilbury	60.3	63	2.7
Simcoe	114	103.2	.....
Waterford	35	97.8	62.8
Lambeth	50.9	17.9	.....
Grantham Township	12.3	17.4	5.1
Dresden	70	68.3	.....
Dorchester	20.7	16	.....
Comber	19.5	21.4	1.9
Burford	45.6	31.5	.....
Bothwell	28	28.1	.....
St. George	45.6	38.2	.....
Dutton	47	44.9	.....
Thamesville	52.9	45	.....
Blenheim	53.6	77.7	24
Lynden	6.7	79.7	73.1

A list of the municipalities connected to the Niagara System during the last year is given below.

Municipality.	Date connected	Initial Load in H.P.	Load in H.P. Oct., 1916	Increase in H.P.
Ailsa Craig	Dec. 15th, 1915	15.3	16	.7
Niagara Falls	Dec. 19th, 1915	371.3	2,364.5	1,993.2
Otterville	Jan. 15th, 1916	10	11.7	1.7
Petrolia	Apr. 25th, 1916	134	146	12
Exeter	May 4th, 1916	57	77.7	20.7
Milverton	May 18th 1916	26.5	33.5	7.
Listowel	May 27th, 1916	90.3	117.9	27.6
Palmerston	June 6th, 1916	83.7	93	9.3
Granton	June 29th, 1916	10	12.4	2.4
Harriston	June 30th 1916	56.3	52.9	.....
Wyoming	Oct. 4th, 1916	22.7	22.7	.....
Wellesley	Oct. 23rd, 1916	13.4	13.4	.....
Burgessville	Oct. 26th, 1916	8	8	.....
Tavistock	Oct. 26th, 1916	28	28	.....

SEVERN SYSTEM

The Commission's generating station at the Big Chute on the Severn River was overtaxed toward the middle of the fiscal year by the relatively large increase of the power demand of this district, as on the Niagara System, the increase in load resulting from the same cause. The steps taken to remedy this condition will be mentioned later.

The operation of the generating station, sub-stations and transmission lines was very satisfactory and the increased load was taken care of in a very creditable manner. The Trent Valley Canal contractors completed certain work on the canal scheme in the vicinity of the generating station which greatly benefited the control of the head and tail water at this plant. Other special maintenance work was carried out by which the hydraulic regulation was improved.

A slight change was effected in the construction of the power and telephone lines of the Power House-Waubauskene Section where these lines cross Matcheash Bay, by the erection of an "A" frame structure with rock crib foundation to shorten this long span. This has eliminated trouble which was previously experienced at this point during very severe wind storms.

The temporary 22,000-volt pole type interswitching station at Waubauskene was moved to a new location on the Commission's property and altered slightly in design. The change was made to accommodate additional lines built from this point and for more efficient control of all lines from this operating centre.

The work commenced in October, 1915, on the stringing of a second telephone circuit between Waubauskene and the power house was completed and placed in operation in the late fall. The additional rod of right-of-way acquired on each side of the line from Midland to Penetang was cleared of trees through the bush section of that line.

Two new customers were connected to the Severn System lines during the year. Camp Borden, the new military training grounds prepared by the Department of Militia and Defence, was first supplied with power on June 29th, when the water pumps and the camp lighting was put in operation. The camp sub-station is fed over a single circuit of No. 6 copper tapped by means of airbreak switches on to the main transmission lines near the Barrie sub-station.

The elevator of the Canadian Pacific Railway at Port McNicoll was first supplied with Hydro power on July 25th. The Company's station is fed from a double circuit of No. 1/0 aluminum from the Midland-Penetang main line, which was double circuited from Waubauskene to this point during the summer. This company is being supplied with approximately 1,000 h.p. of off peak power at 575 volts during the season of navigation, in addition to approximately 250 h.p. for the operation of wharf machinery, lighting, etc., which will be utilized throughout the entire year. Below will be found a list of the demands of the various municipalities in October, 1915 and 1916, and the increase during the year.

SEVERN SYSTEM

Municipality	Load in H.P. Oct., 1915	Load in H.P. Oct., 1916.	Increase in H.P.
Midland	500	815	315
Penetang	415.5	495	79.5
Collingwood	572.4	888.7	316.3
Barrie	368.6	541.5	72.9
Coldwater	37.5	34.8	.....
Elmvale	54.8	36.2	1.4
Stayner	81.7	56.3	.....
Creemore	48.2	38.8	.....
Orillia	1239.9	1414	174.1
Waubauskene	18.1	16.8	.....
Port McNicoll	23.4	19.3	.....
Victoria Harbor	29.5	26.8	.....

New Stations on Severn System

Customer	Date connected	Initial load in H.P.	Present load in H.P.	Increase in H.P.
Camp Borden,	June 29th, 1916.....	225	325.7	100.7
C.P.R. Elevator....	July 25th, 1916.....	600	1176.6	576.6

OPERATING STATEMENT, FISCAL YEAR 1915-16.

Capital Investment as at October 31st, 1916:

Big Chute Power Development, including Generating and Transformer Station	\$349,787 46
Transmission Lines	335,497 20
Distributing Stations	78,451 08

Total Operating Capital	\$763,735 74
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Revenue as per details below

Midland Power Accounts	\$10,856 88
Penetang "	11,983 47
Collingwood "	23,613 38
Barrie "	13,970 30
Coldwater "	1,007 77
Elmvale "	1,335 50
Stayner "	2,800 01
Creemore "	2,254 47
Orillia "	13,229 32
Waubauskene "	640 19
Port McNichol "	698 22
Victoria Harbor "	1,762 98
Camp Borden "	3,592 45
C.P.R. Elevator "	6,949 99
	<u>\$94,694 93</u>

Expenditures

Operators' and Patrolmen's Salaries and Expenses and proportion of Administration and General Office Expense	\$18,152 30
Cost of Power purchased from Wasdell and Eugenia Systems	6,366 26
Interest on Capital Investment	29,920 27
	<u>\$54,438 83</u>
Surplus applicable to Sinking Fund and Depreciation Reserve Accounts	\$40,256 10

EUGENIA SYSTEM

The second generating station which the Commission has constructed was placed in official operation by Sir Adam Beck on November 18th when the municipalities of the Eugenia System received Hydro power for the first time. The service supplied on this system has quite fulfilled the Commission's expectations in every way.

The hydraulic and electrical features of the generating station have been given detailed description in previous reports.

The transmission system now comprises 195 miles of 22,000-volt and 24 miles of 4,000-volt lines. The municipalities now served on this system are Owen Sound, Mount Forest, Durham, Dundalk, Flesherton, Chatsworth, Markdale, Holstein and Chesley.

On June 13th a part of the Pine River System which was acquired by the Commission was connected to the Eugenia System by means of a thirty mile tie line built between Dundalk and Shelburne. The municipalities thus supplied were Orangeville, Shelburne and Horning's Mills. While satisfactory service was delivered since the acquisition of this system, the Commission is taking steps to place it on a par with the operating condition of the balance of the Eugenia System. This will consist of the erection of new sub-stations at Shelburne and Orangeville and complete renovation of the 22,000-volt lines between these points. The future outlook for this portion of the Eugenia System is very bright.

The actual operation and maintenance of the Eugenia System is carried on jointly by co-operation with the municipalities supplied. The success of this scheme was no exception to that enjoyed on the other northern systems.

Below will be found a tabulation showing the date of connection, initial load and load taken in October, 1916, of the municipalities on this system.

Eugenia System

Municipality	Date connected	Initial load in H.P.	Load in H.P. Oct. 1916	Increase in H.P.
Owen Sound.....	November 18th, 1915.	899.5	992.	92.5
Flesherton	" "	29.5	36.2	6.7
Dundalk.....	" "	50.9	50.2	.....
Durham	" "	81.7	63.9	.....
Mt. Forest	" "	156	98.5	.....
Chatsworth.....	December 17th, 1915.	8	25.4	17.4
Markdale.....	November 18th, 1915.	67	60	.....
Holstein	April 3rd, 1916.....	6.8	16.9	10.1
Chesley	June 18th, 1916	87	80.4	.....
Shelburne	" 13th "	45	51.2	6.2
Orangeville.....	" 13th "	60	128.7	68.7
Horning's Mills....	" 13th "	5	5	.....

EUGENIA SYSTEM

OPERATING STATEMENT, FISCAL YEAR 1915-16.

Capital Investment as at October 31st, 1916:

Eugenia Falls Power Development and Generating Plant	\$638,854 14
Eugenia Distributing Stations	51,944 33
Eugenia Transmission Lines	409,355 93
Total Operating Capital	<u>\$1,100,154 40</u>

Revenue as per details below

Owen Sound Power Accounts, December to October..	\$22,536 94	
Flesherton " " " ..	733 13	
Dundalk " " " ..	1,232 32	
Durham " " " ..	1,825 00	
Mount Forest " " " ..	3,226 07	
Chatsworth " January " ..	662 70	
Markdale " March " ..	933 36	
Holstein " May " ..	185 96	
Chesley " July " ..	1,076 01	
Orangeville " " " ..	979 12	
Shelburne " " " ..	500 50	
Hanover " September 16 to October 31	183 12	
Severn System " October 6 to October 31	2,520 13	
Hornings Mills " " "	70 17	
		<u>36,669 53</u>

Expenditures

Operators' and Patrolmen's Salaries and Expenses and proportion of Administration and General Office Expenses	\$14,584 03	
Interest on Capital Investment	34,205 94	
		<u>48,789 97</u>
Deficit on operation		12,120 44

WASDELLS SYSTEM

While the power demand of the municipalities fed from the Wasdells System does not indicate the same growth which characterized the operation of some of the other systems, very satisfactory progress was maintained. A thoroughly reliable and continuous service was provided. The power house, transmission lines, and sub-stations required no extensive repairs and are in first-class operating condition.

The excess capacity available at the power house over what was required for serving the Wasdells System was very conveniently and economically utilized to take care of the increased power demand of the municipalities of the Severn System.

A tie line between the power house and the Orillia substation at Longford, constructed during the summer, made this arrangement possible, and after parallel operation was commenced on July 24th, the Wasdells power house supplied an average load of 750 h.p. continuously throughout the balance of the year without difficulty. Thus the Big Chute generating station was relieved of the greater part of the power demand of the municipality of Orillia, at Orillia and at Longford.

Wasdells System

Municipality	Load in Oct., 1915 H.P.	Load in Oct., 1916 H.P.	Increase in H.P.
Beaverton	54.9	56.3	1.4
Brechin	37.5	36.2	.....
Cannington	46.9	57.6	10.7
Sunderland	20.1	52.2	32.1
Woodville	49.6	48.2	.....

OPERATING STATEMENT, FISCAL YEAR 1915-16.

Capital Investment as at October 31st, 1916:

Wasdells Power Development and Generating Plant	\$136,658 47
Wasdells Distributing Stations	13,616 24
Wasdells Transmission Lines	114,406 03
Total Operating Capital	\$264,680 74

Revenue as per details below

Beaverton Power Accounts	\$3,156 97	
Brechin "	2,615 77	
Cannington "	3,163 11	
Sunderland "	2,018 92	
Woodville "	3,354 15	
Severn System "	3,846 13	
		\$18,155 05

Expenditures

Operators' and Patrolmen's Salaries and Expenses, including supplies	\$3,461 02	
Administration and General Office Expenses	1,010 19	
Interest on Capital Investment	9,114 66	
		13,585 87
Surplus applicable to Sinking Fund and Depreciation Reserve Account		\$4,569 18

PARALLEL OPERATION OF THE SEVERN, EUGENIA AND WASDELLS SYSTEMS

As mentioned above, some action became necessary to relieve the load conditions at the Big Chute generating station caused by the increase of the power demand of the municipalities fed from this plant.

The first step in this direction was the erection of a 22,000-volt tie line of No. 1/0 aluminum, seven miles long, between the Wasdells power house and the sub-station belonging to the Municipality of Orillia at Longford. The balance of the circuit was completed by the existing Orillia 22,000-volt lines via the Orillia transforming and switching stations and the Big Chute plant. To complete telephone communication between the plant arrangements were made with Orillia to erect a telephone circuit on the power line poles between Orillia and Longford.

The two plants were placed in normal parallel operation on July 24th, the Wasdells plant supplying practically all the load previously taken by Orillia from the Big Chute plant in addition to the load taken by the municipalities of the Wasdells System. Thus the primary object was gained of loading the Wasdells plant to a degree of economical operation and reducing the load on the Big Chute plant.

The power supply for the Severn System was further augmented by the paralleling of the Eugenia plant with the Big Chute plant. This was accomplished by the erection of a 22,000-volt tie line of No. 1/0 copper and No. 9 iron telephone circuit, twenty-four miles long, between the Eugenia power house and the Collingwood distribution station. The tie line was built in an incredibly short space of time and power from the Eugenia plant was first supplied to the Severn System on October 6th. Temporary metering equipment was installed at both the Wasdells and the Eugenia plants to measure the interchange of power.

The parallel operation of these systems has been entirely satisfactory, with added security of service to all customers supplied therefrom.

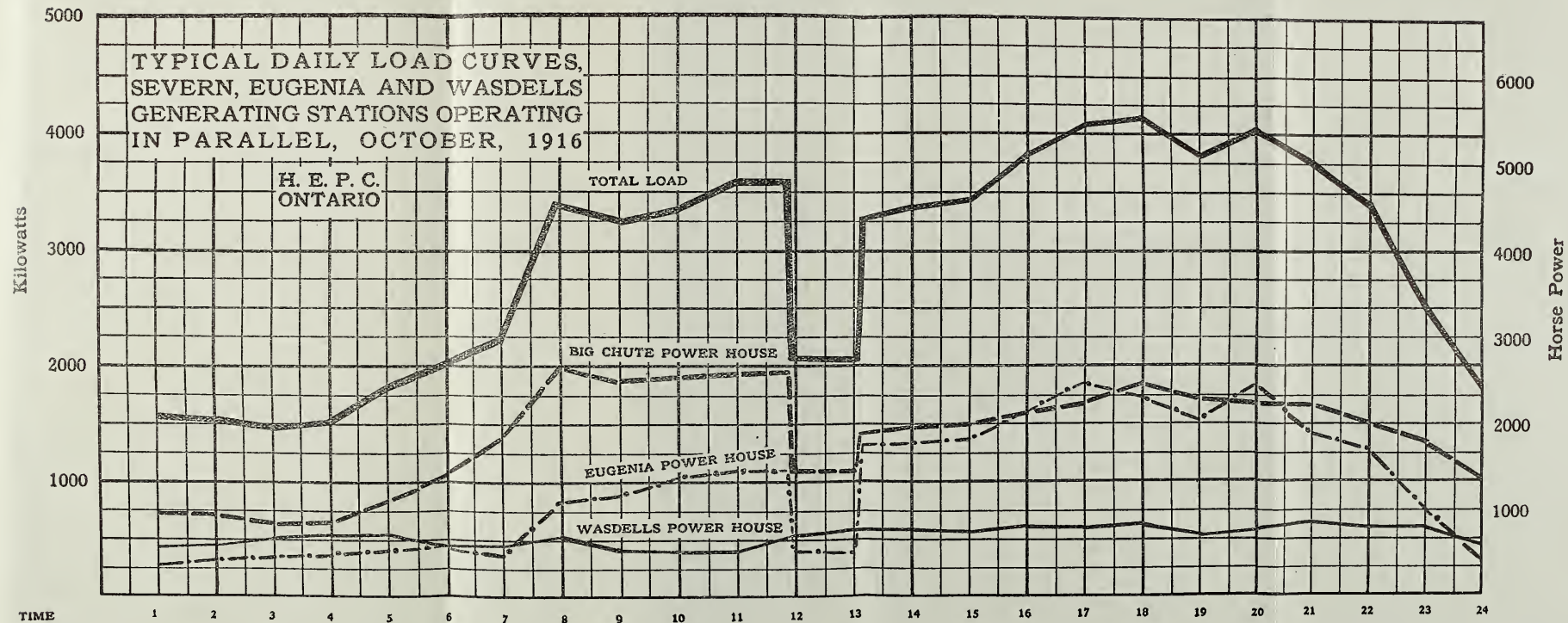
On another page will be found curves showing typical fall operating conditions for twenty-four hours with the three systems in synchronism.

CENTRAL ONTARIO SYSTEM

The operation of the Central Ontario System has been entirely satisfactory since passing into the hands of the Commission. On account of the various points of supply total interruptions to service are almost impossible and have seldom, if ever, occurred. The operation of equipment has been most successful, no failures of any importance having taken place.

The steadily growing load at various points has necessitated some readjustment of equipment. One 750 k.v.a. transformer was moved from Port Hope to Oshawa, bringing the capacity of that point up to 2,250 k.w., and on account of the construction of the Government arsenal at Lindsay it was necessary to interchange two 300 k.w. units at Lindsay for two 750 k.w. units from Cobourg. At other points equipment of less importance has been replaced by apparatus more suitable to existing load conditions than that formerly used.

Practically all equipment which had become obsolete or unfit for service was scrapped and advantage taken of the high prices for scrap metals at present in force. Careful studies of the lines were made and whenever it was profitable the amount of conductor material was reduced to the most economical point. The material recovered in this way enabled almost all extensions necessary to be taken care of without delay and without the purchase of additional conductor.



While the growing load will undoubtedly soon overtake the present capacity of generating plants it has been possible to carry all load this year without taxing equipment and with a conservative amount of reserve apparatus available.

Loads at the various towns are shown in the table below and the curve of the weekly peaks shows the growth of load since this property has been under the control of the Commission. Another table shows the total output of the system for the current year and comparison of operation for the year 1915.

Power Generated, Central Ontario System

Month	Peak Load, 1915	Peak Load, 1916	Increase in H.P.
November	15,100	17,800	2700
December	13,400	18,190	4790
January, 1916	13,300	16,150	2850
February	12,560	13,700	1140
March	11,500	13,750	2250
April	11,610	12,640	1030
May	11,100	12,650	1550
June	10,600	15,300	4700
July	11,980	15,600	3020
August	14,570	15,850	1280
September	14,550	16,500	1950
October	16,200	18,600	2400
Peak for year	16,200	18,600	1800

Municipality	Load in H.P. October, 1916
Whitby	217
Bowmanville	1247
Oshawa	1568
Newcastle	20
Orono	20
Port Hope	375
Cobourg	502
Colborne	75
Brighton	72
Trenton	670
Belleville	1434
Napanee	315
Deseronto	302
Stirling	75
Tweed	87
Lindsay	1062
Peterboro	3067
Millbrook	38

MUSKOKA SYSTEM

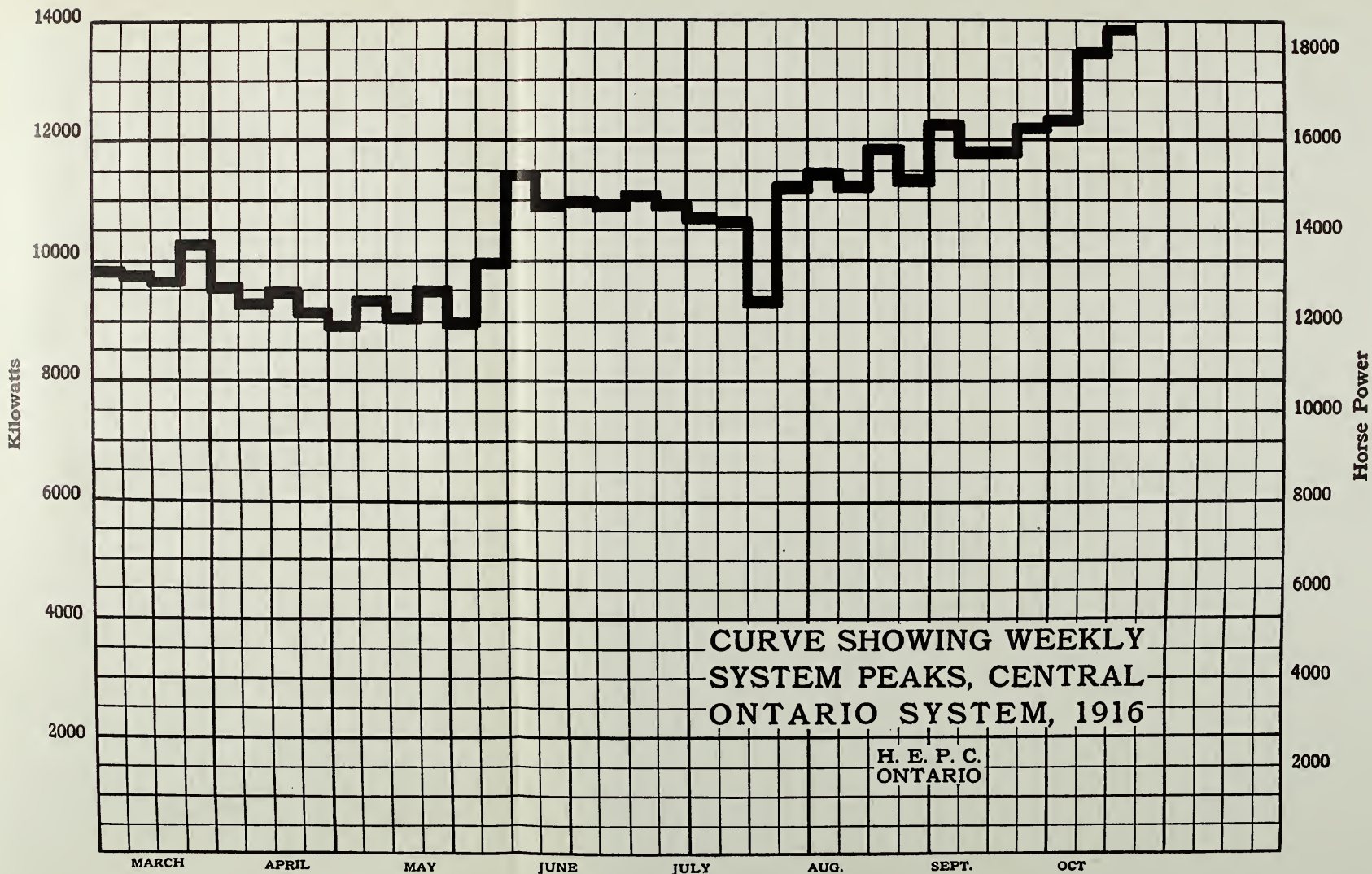
The power development on the south branch of the Muskoka River at Muskoka Village which had been taken over from the Municipality of Gravenhurst was formally under operation by the Commission on November 1st. The purchase comprised the power site which had been partially developed by the municipality and the existing generating station and hydraulic works on the property. On November 1st power was being supplied to Gravenhurst at 6,600 volts and a small amount to Muskoka Village at 120 volts.

The Commission immediately proceeded with the extension and remodelling of the generating station to place it in first-class operating condition and to deliver the power covered by contract with the Municipality of Huntsville. A detailed description of the new hydraulic and electrical equipment of the plant will be found in another section of the report. Every effort was exerted by the Commission to supply uninterrupted service during the alterations to the station.

On August the 15th a 26 mile, 22,000-volt, No. 2 S.R. aluminum line to Huntsville distribution station was made alive for test. The sub-station was placed in operation permanently on August 25th.

All construction details at the power house were not completed at the end of October, which was due to the difficulty in obtaining reasonable delivery of materials.

The peak load demands of the Municipalities of Gravenhurst and Huntsville for the month of October were 235 and 580 h.p. respectively. The Commission will be in a position to supply standard service and anticipates a very successful future for the Muskoka System.



PORT ARTHUR SYSTEM

Steady progress was made in the operation of the Port Arthur System during the past year. The increase in load was taken care of by loading the Current River Hydraulic Plant of the City of Port Arthur to its full capacity. Thus the Commission was not obliged to increase the present reserve demand of 2,600 h.p. from the Kaministiquia Power Company. The Company's power supply to the Commission during the year was of the usual high standard.

The total demand from both sources is approximately 5,100 horse-power at the present with indications of a very material increase in the near future.

The more uniform routine of operation established in 1915 whereby the load control of the Current River station was placed in the hands of the Commission's operators has proved very economical in every respect.

The Hydro transforming sub-station is in excellent condition, and no failures were reported during the year.

Plans and specifications were prepared and material ordered for the erection of a wood pole line entrance and switching structure, at the transformer station to provide a means of sectionalizing the two 22,000 volt outgoing circuits to the grain elevators and to the waterworks station. This work will be carried out in conjunction with the Port Arthur Commission. Five air break switches will be installed on this structure. The Port Arthur Commission is proceeding with the erection of two air break switches on each of the lines built to the elevators and to the waterworks station. When these installations are completed it will be possible to feed any one of the four elevator stations from either of the two outgoing 22,000 volt lines from the sub-station and will greatly increase the flexibility and security of the service on the high tension portion of the system.

Capital Investments for the Port Arthur System to October 31st, 1916:

Transmission Lines	\$21,303 12
Transformer Stations	86,089 91

Total Operating Capital	\$107,393 03
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The Operating and Maintenance Expenses for the fiscal year ending October 1916, are as follows:—

Operators' Salaries and Expenses, including Operating supplies, and proportion of Administration and General Office Expenses	\$5,721 88	
Interest at 4% per annum ..	4,325 00	
Sinking Fund at 1.8% per annum	1,946 25	
Cost of Power	37,365 00	
		\$49,358 13

A Financial Statement of Operation for the fiscal year ending October 31st, 1916 is given below:—

Sum of monthly loads delivered and value, including charges for Administration, General Expenses, Operation, Interest, Sinking Fund and Depreciation	28,080 h.p.	\$54,322 11
Sum of monthly loads purchased and value, including Administration, General Expense, Operation, Interest and Sinking Fund	28,080 h.p.	49,358 13
Surplus applicable to Depreciation Reserve		\$4,963 98

THE ST. LAWRENCE SYSTEM

The operation of the Commission's system on the St. Lawrence River for the past year proved very successful. The service received from the hydraulic plant at Iroquois was thoroughly reliable and practically no interruptions occurred. A recent inspection of the Commission's sub-stations and lines shows that so far the depreciation of this system is quite negligible.

The total load demand of the municipalities during the year increased to 1,000 h.p., an amount considerably above the capacity of the generating station at Iroquois. This difficulty was temporarily solved by paralleling the municipal auxiliary steam plant at Brockville with the Commission's power supply purchased at Iroquois.

The transpositions in the transmission line between Morrisburg and Prescott are being rearranged to remove the inductive effect which has interfered with the proper operation of the Bell Telephone Company's line paralleling this line. A series of very interesting tests from an engineering standpoint are being made in connection with this work.

Municipality.	Load in Oct., 1915.	Load in Oct., 1916.	Increase in
	H.P.	H.P.	H.P.
Brockville	335	348.5	13.5
Prescott	205	217	12
Winchester	60.3	58.9	...
Chesterville	40.2	48.2	8.
Williamsburg	29.5	17.4	...

ST. LAWRENCE SYSTEM OPERATING STATEMENT, FISCAL YEAR 1915-16.

Capital Investments as at October 31st, 1916:

St. Lawrence Distributing Stations	\$23,063 25
St. Lawrence Transmission Lines	147,013 62

Total Operating Capital	\$170,076 87
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Revenue as per details below

Prescott Power Accounts ..	\$4,462 11	
Chesterville "	1,838 69	
Winchester "	2,321 42	
Williamsburg "	563 21	
Brockville "	8,340 86	
		17,526 29

Expenditures

Operators' and Patrolmen's Salaries and Expenses proportion of Administration and General Office

Expense	\$1,559 66	
Interest on Capital Investment	6,783 35	
Cost of Power purchased	5,513 89	
		13,856 90

Surplus applicable to Sinking Fund and Depreciation

Reserve Accounts	\$3,669 39
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TOTAL CAPITAL INVESTMENT TO OCTOBER 31st, 1916

Following is a statement of expenditures on Capital Account, including Niagara, Severn, St. Lawrence, Wasdells, Eugenia, Muskoka, Port Arthur, Renfrew and Ottawa Systems, Stock on Hand, Tools and Equipment, Municipal Construction.

Niagara System—Transmission Lines

Right-of-Way	\$1,034,920 58	
Steel Tower Lines	3,403,585 05	
Telephone Lines	129,706 69	
Relay System Lines	54,537 32	
Conduit System (Ont. Power Co. to Niagara Station) ..	96,698 64	
		\$4,719,448 28
Right-of-Way (Dundas-Toronto), in course of construction	\$6,366 37	
Steel Tower Lines, in course of construction	8,631 74	
Conduit System, in course of construction	22,157 54	
Telephone Line (Section A), in course of construction ..	1,297 70	
		38,453 35
Wood Pole Lines	\$1,785,208 01	
Wood Pole Lines, in course of construction	189,094 42	
		1,974,302 43
Welland and St. Catharines District Lines	\$16,445 63	
		16,445 63
Rural Line Construction	\$324,168 44	
		324,168 44
Power Development, Right-of-Way and Preliminary Engineering	\$33,512 91	
		33,512 91

Transformer Stations

Stations	\$2,797,209 61	
Stations and Extensions to same, in course of construction	34,415 66	
		2,831,625 27
Distributing Stations	\$221,130 02	
Distributing Stations, in course of construction	10,634 26	
		231,764 28

Severn System

Big Chute Power Development, including Generating and Transformer Stations	\$349,787 46	
Transmission Lines	335,497 20	
Distributing Stations	78,451 08	
Distributing Stations Extensions in course of construction	1,409 83	
		765,145 57

St. Lawrence System

Transmission Lines	\$147,228 58	
Distributing Stations	23,063 25	
Distributing Stations in course of construction	6,366 07	
		176,657 90

Wasdells System

Power Development, including Generating and Transformer Station	\$136,658 47	
Transmission Lines	114,406 03	
Distributing Stations	13,637 00	
		264,701 50

Eugenia System

Power Development, including Generating and Transformer Station	\$638,854 14	
Transmission Lines	409,355 93	
Distributing Stations	51,944 33	
Distributing Stations in course of construction	1,249 29	
Transmission Lines in course of construction	36,276 66	
Operation	12,120 44	
		1,149,800 79

Muskoka System

South Falls Power Development, including Generating and Transformer Station	\$78,707 61	
Transmission Line	52,626 47	
Distributing Station	8,923 95	
Operation	912 26	
		141,170 29

Port Arthur System

Transmission Lines	\$21,303 12	
Transformer Station	86,089 91	
		107,393 03

Renfrew System

Round Lake Storage Dam	\$20,168 86	
Power Development (repayable)	717 41	
		20,886 27

Ottawa System

Meter Equipment	\$432 39	
		432 39

General Accounts (Chargeable)

Municipal and Rural Construction Work repayable ..	\$290,247 62	
Sales to Municipalities	159,226 01	
Renfrew District Operating Charges	2,519 82	
		451,993 45

General Accounts (Capitalized)

Office Furniture, Equipment, Stationery, Unexpired Insurance, etc.	\$36,531 78	
Office Furniture and Equipment, Electrical Inspection Dept.	3,863 60	
Toronto Storehouse, Testing Laboratory, Garage and Machine Shop	117,883 72	
Dundas Storehouse	1,586 04	
Automobiles and Trucks (Depreciated value)	27,480 29	
Office Building	335,866 60	
		523,212 03

Stock and Tools

Stock on hand for construction purposes and sale to Municipalities	\$163,673 72	
Line Maintenance Stock for all Systems	59,905 07	
Operating Department's Testing and Metering Equipment for all Systems	2,609 76	226,188 55
Line and Station Construction Tools and Equipment ..	\$4,000 32	
Line and Station Maintenance Tools	6,666 08	
Hydraulic Construction Tools	1,402 88	12,069 28
Laboratory Operation	\$9,482 04	
Machine Shop Operation (Stock)	520 35	10,002 39
		<u>\$14,019,374 03</u>

PROVINCIAL EXPENDITURES

Fiscal Year 1915-16

Engineering assistance to non-operating Municipalities for the gathering of data throughout the Province for statistical purposes; reports on Municipal operation	\$19,897 74	
Municipal estimates for power supply non-operating Municipalities and also rates investigations	4,058 45	
Hydrographic surveys, storage surveys, reports and investigations on power sites and stream flow for the Province.....	31,366 77	
Reports and statistical data on overhead and underground construction for Municipalities; investigations relative supply of power to rural districts and gathering information with respect to the use of electricity along lines not at present operated by the use of such	8,625 85	
Engineering investigations, surveys and reports on proposed Municipal Electric Railways	38,675 66	
Administration and general office expense over all above expenditures	28,140 55	
	<u>\$130,765 02</u>	
<i>Less:</i>		
<i>Credits:</i> —Various supplies, equipment and capital expenditures charged Province former years, now capitalized in Commission's books, sold, or placed in stock	38,391 49	\$92,373 53
Electrical Inspection—Balance of operating expenses for the year, not including capital investment, such as furniture, typewriters, etc., which is carried forward		31,345 53
Special Hydrographic Investigations—Lake-of-the-Woods Districts for the Department of Lands and Mines		1,972 02
Equipment on hand purchased for Hydrographic work		1,353 28
		<u>\$127,044 36</u>

BALANCE SHEET

OCTOBER 31st, 1916.

Assets

Sundry Expenditures, per list	\$14,019,374 03
Warrantable Advances	35,118 16
Unpaid Power Bills, October 31st, 1916	375,579 20
Cash on hand	297,140 80
	<hr/>
	\$14,727,212 19

Liabilities

Provincial Treasurer	\$13,588,667 72
Niagara System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	939,814 38
Wasdells System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	4,569 18
Severn System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	57,030 56
St. Lawrence System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	4,345 93
Welland System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	1,449 24
Port Arthur System, Surplus applicable to Sinking Fund and Depreciation Reserve Account	27,151 56
Ottawa, applicable to unpaid Power	1,204 00
Interest Account	54,061 38
Cable Reels	210 85
Central Ontario System Balance	38,536 29
Storehouse Operation, Surplus	6,697 03
Garage Operation, Surplus	533 25
Administrative Office Building, applicable to Sinking Fund	2,940 82
	<hr/>
	\$14,727,212 19

MUNICIPAL ACCOUNTS

The results from municipal distribution of Hydro power are shown in the tables submitted in this section. In accordance with the requirements of the Ontario Government the municipal year ends on December 31st. The tables which follow under "Municipal Accounts" cover the calendar year ending December 31st, while all other sections of the annual report deal with the fiscal year ending October 31st.

The work of standardizing the electrical accounts of the Hydro-Electric municipalities, commenced in 1912, has been continued. During the year accounting systems were established in Ailsa Craig, Blenheim, Brockville, Chesley, Chatsworth, Dundalk, Durham, Exeter, Flesherton, Grantham Township, Gravenhurst, Granton, Harriston, Holstein, Listowel, Markdale, Milverton, Mount Forest, Niagara Falls, Orangeville, Otterville, Owen Sound, Palmerston, Petrolia, Ridgetown, Stamford Township, Sarnia and Shelburne, and the local officers instructed in the proper handling of the books.

A periodical inspection has been made of the electrical accounts of all Hydro-Electric municipalities, our accountants assisting the local officers by suggesting improved methods of office routine, and in the case of smaller towns and villages, where the utility is in charge of men of little bookkeeping experience, actually doing most of the accounting.

The system of monthly balance sheets and operating reports enables the Provincial Commission to keep in close touch with local conditions, and from the reports and other data collected and worked up by the auditors, the capital expenditure and operating expenses are periodically divided into the principal revenue accounts, lighting, commercial power, municipal power and street light, these in turn being set against the respective revenues for the purpose of rate adjustment.

This data enables this Commission to authorize and enforce a schedule of selling rates in each municipality which makes each of the above-named revenue departments self-supporting, so that an excessively high rate in one does not take care of a deficit in another.

The seven statistical reports which follow show the result of operation and the present status of the electric utilities in the one hundred and twenty-eight municipalities in which the service has been installed long enough to justify a report.

The municipalities have been listed in the order of their size according to Municipal Bulletin No. 10, Bureau of Industries of the Ontario Department of Agriculture; the populations are shown and the statistics permit an intelligent comparison of operating results in municipalities where conditions are similar. This is resulting in a friendly rivalry between the municipalities for an increased load, an efficient and economical administration, and an intelligent effort to improve the load factor, which is so essential to low selling rates.

Statement "A" is a comparative condensed balance sheet of each municipality as at December 31st, 1915, and December 31st, 1916, showing the plant cost in logical subdivisions, and other items making up the total assets. The true or quick liabilities, such as debenture balance, bank overdraft and accounts payable, are totalled separately before including such reserve accounts as debentures paid, sinking fund reserve, depreciation reserve and surplus. In this way

the relative increase in plant value and net debt during the year in any municipality can be quickly determined.

The percentage of net debt to plant cost at the end of each year has been worked out, and shows a marked decrease. Special attention is called to this very interesting and gratifying feature.

All of the accounts appearing in the balance sheet under "Reserves," such as "Debentures Paid," "Sinking Fund Reserve," "Depreciation Reserve," and "Surplus," might properly be called surplus and represent the gross profit from operation.

While a proper depreciation charge has been included in the operating expenses from the beginning, the plant extensions resulting from the growth of the service have in most cases absorbed most of the depreciation funds. A proper accounting has been kept of this, and interest credited the Depreciation Reserve on the funds so used. A characteristic feature of the operation during the past two years has been a steady increase in the cash balances, which in some cases now amount to more than 25 per cent. of the total plant cost, notwithstanding the constant reductions in selling rates. Many commissions have loaned cash to the municipalities, and some have invested largely in Canadian War Loans, an innovation unique in the operation of civic utilities.

Statement "B" is a condensed operating report for the year ending December 31st, 1916, showing the result in each municipality. The population and the number of consumers in each class is also given to facilitate comparisons. In some cases where the power was turned on subsequent to January 1st, the proportion of the annual fixed charges corresponding to the period of operation has been used, and in other municipalities where the operation covers a very short period, and no actual payment has been made, the fixed charges have been omitted entirely to simplify the accounting in future years and avoid the necessity for annual adjustments.

The cost of the service, which is the basis on which service is billed to the consumers includes every possible loading, i.e., cost of power, operation, maintenance, administration, interest and sinking fund payments on debenture debt, and in addition the sinking fund equivalent of a 5 per cent. straight line depreciation charge. No utility is considered to be on a satisfactory basis until the revenue is sufficient to meet this burden. The rate of depreciation, however, is subject to modification to meet unusual conditions such as large investments for land or perpetual water rights—concrete construction, unusual types of overhead or underground construction or short term debentures.

A study of Statement "B" will show that of the 128 municipalities reported, the revenue in 111 was sufficient to take care of all operating and fixed charges and depreciation, in 11 others all charges except full depreciation were met, and in six only was there an actual loss, due to local conditions, which will correct themselves. The net credit balance of surplus from the year's operation in 128 municipalities, amounted to \$357,393.72, and the systems are now serving 148,732 customers, and a population of approximately 1,155,000.

Statement "C" shows in detail the comparative revenue and expenses in each municipality for the past four years. This shows graphically the increase in business year by year and the gradual decrease in the proportion of revenue contributed by the municipal utilities. In comparing the cost of power purchased, the varying price paid per horse-power must be taken into consideration. This schedule will be found in Statement "F."

Statement "D" shows for each municipality for each year of operation, the number of consumers served with light and power, the average monthly kw. hr. consumption, the average net cost per kw. hr., and the average net monthly bill. This is a tabulation of data never before attempted, so far as can be determined, and while built up on information not originally obtained for this purpose, and subject to errors, the averages are substantially correct and show the constantly increasing monthly consumption and decreasing net cost per kw. hr. and average monthly bill, and reflects the satisfactory nature of the service from the standpoint of the consumer.

Statement "E" shows the approximate installation and annual cost per lamp of the street lighting service in cities, towns and villages where Hydro service has been installed. An interesting feature is the annual cost per capita based on the total populations.

Statements "F" and "G" show comparatively the cost of power to the municipalities, the selling rates for power and light in 1912, 1913, 1914, 1915 and 1916 and the recommended rates for 1917.

In order that the effect of the Hydro co-operative scheme on the Hydro municipalities as a whole may be clearly shown, the operation for the past five years of all municipalities has been consolidated into one report, likewise the balance sheets for four years. These consolidated reports show the sound financial condition of the enterprise from the municipal standpoint and meet every criticism against municipal ownership and operation of electric utilities as carried on under the control of the Commission. Particular attention is called to the steady decrease in the percentage which the net debt balance bears to the total assets each year.

CONSOLIDATED OPERATING REPORTS

—	1912	1913	1914	1915	1916
Number of Municipalities included	28	45	69	99	128
EARNINGS					
Domestic Light.....		\$ 572,154 38	\$ 789,130 81	\$ 944,271 08	\$ 1,172,878 96
Commercial Light.....		525,438 16	673,803 92	720,209 26	812,130 78
Power.....		905,378 17	1,214,829 31	1,501,797 78	1,921,152 31
Street Light.....		560,925 56	698,409 71	835,970 87	930,057 48
Miscellaneous.....		53,543 24	57,482 41	68,046 29	147,381 50
Total.....	\$ 1,617,674 00	\$ 2,617,439 51	\$ 3,433,656 16	\$ 4,070,295 28	\$ 4,983,601 03
EXPENSES					
Power Purchased.....		\$ 789,632 87	\$ 1,045,752 65	\$ 1,485,614 73	\$ 1,959,446 83
Sub-Stn. Operation		78,394 81	97,658 90	107,607 31	153,761 08
“ Maintenance.....		18,698 46	31,790 99	25,935 56	46,131 53
Dist. System, Operation and Maintenance.....		104,114 51	130,998 65	154,409 71	154,247 17
Line Transformer Maintenance.....		8,547 61	11,764 32	11,508 92	14,528 17
Meter		5,222 19	9,536 07	12,899 14	24,218 48
Consumers' Premises—Expenses.....		53,108 38	65,192 23	47,494 26	52,602 01
Street Light System, Operation and Maintenance.....		84,903 76	113,047 80	136,983 38	145,471 50
Promotion of Business.....		72,303 51	86,683 02	74,402 55	79,324 85
Billing and Collecting.....		77,351 76	103,560 71	131,541 27	154,508 58
General Office, Salary and Expenses.....		154,932 69	230,899 75	236,777 86	306,709 35
Undistributed Expenses.....		64,538 69	81,261 28	94,978 89	88,646 53
Interest and Debenture Payments.....		528,549 21	662,092 34	817,978 89	951,781 99
Miscellaneous Expenses.....		884 95	8,089 63	34,230 26	8,687 44
Total Expenses.....	\$ 1,377,168 00	\$ 2,041,183 40	\$ 2,678,328 34	\$ 3,371,414 00	\$ 4,140,065 51
Surplus	\$ 240,506 00	\$ 576,256 11	\$ 755,327 82	\$ 698,881 28	\$ 843,535 52
Depreciation Charge.....	\$ 124,992 47	\$ 262,675 24	\$ 357,883 31	\$ 414,506 99	\$ 486,141 80
Surplus Less Depreciation Charge	\$ 115,513 53	\$ 313,580 87	\$ 397,444 51	\$ 284,374 29	\$ 357,393 72

Note.—Details of 1912 Revenue and Expenses not now available.

STATE

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Toronto		Hamilton					
Population	463,705		100,461					
—	1915	1916	1915	1916				
ASSETS	\$	c.	\$	c.				
Lands and Buildings	373,733	08	703,215	79	59,020	10	72,609	20
Sub-Station Equipment	729,143	69	946,400	28	89,694	10	89,713	89
Distribution System, Overhead.....	1,554,253	98	1,703,286	32	287,116	34	300,134	25
“ “ Underground..	685,557	44	852,317	09	156,569	93	157,415	41
Line Transformers.....	394,525	78	394,432	05	88,927	58	102,299	20
Meters.....	564,238	32	638,229	41	125,792	86	146,947	41
Street Light Equipment, Regular..	795,750	64	700,908	22	92,520	48	92,882	82
“ “ Ornamental.....								
Miscel. Equip. and Construction Exp.	1,231,753	03	1,528,054	43	118,426	02	120,189	97
Steam or Hydraulic Plant.....	e 50,106	14	e 34,343	18				
Old Plant.....	f 505,646	83			2,000	00	2,000	00
Total Plant.....	6,884,708	93	7,501,186	77	1,020,067	41	1,084,192	15
Bank and Cash Balance.....	84,220	22	710,141	95				
Inventories.....	440,845	89	425,259	74	34,450	25	32,300	98
Accounts Receivable.....	344,828	27	241,461	01	95,138	39	104,485	43
Sinking Fund.....	480,949	94	590,195	03	50,189	06	72,887	60
Other Assets.....	73,657	99	4,122	20	3,217	39	6,071	12
Total Assets.....	8,309,211	24	9,472,366	70	1,203,062	50	1,299,937	28
LIABILITIES AND RESERVES								
Liabilities								
Debenture Balance.....	6,300,000	00	7,898,000	00	840,000	00	840,000	00
Accounts Payable.....	848,851	48	166,789	53	63,298	69	75,881	85
Bank Overdraft.....					110,745	32	101,022	98
Other Liabilities.....			17,184	46	23,607	37	23,944	75
Total Liabilities.....	7,148,851	48	8,081,973	99	1,037,651	38	1,040,849	58
Reserves								
Debentures Paid.....								
Sinking Fund Reserve.....	480,949	94	590,195	03	50,189	06	72,887	60
Depreciation Reserve.....			736,807	23	55,893	88	92,777	42
Surplus.....	679,409	82	63,390	45	59,328	18	93,422	68
Total Liabilities and Reserves....	8,309,211	24	9,472,366	70	1,203,062	50	1,299,937	28
Percentage of Net Debt to Total Assets	86.0		79.2		86.3		89.0	

"e" Exhibition construction.

"f" Work orders in progress.

MENT "A"

of Hydro Municipalities as at December 31st, 1915 and 1916

Ottawa		London		Brantford		Windsor	
100,163		58,055		25,420		24,162	
1915	1916	1915	1916	1915	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
83,084 17	88,344 15	68,220 17	70,728 19	11,069 21	11,753 82	11,605 94	11,629 09
102,612 38	108,988 09	144,439 34	168,395 04	38,710 52	39,521 99	30,862 05	35,569 56
318,704 90	318,229 86	279,633 40	329,206 48	100,808 23	105,373 04	112,368 72	133,385 25
77,771 77	77,897 39	352 43	352 43	.....	.....	.....	.....
89,194 77	92,663 05	35,324 59	41,516 23	18,750 49	22,384 67	14,516 02	15,567 06
100,689 39	109,891 07	110,487 46	123,342 88	18,837 13	24,735 95	17,839 38	34,904 43
55,895 88	57,433 54	38,441 58	41,191 09	15,909 64	15,920 77	119,163 76	121,476 30
29,957 84	29,957 84	.....	.....	33,053 38	31,068 29	33,621 09	35,404 07
29,293 13	29,847 05	47,031 27	50,627 34	21,357 12	23,919 96	42,499 88	50,445 21
.....	.....	.....	.....	.....	.....	6,548 02	.....
.....
887,204 23	913,252 04	723,930 24	825,359 68	257,995 72	274,678 49	389,024 86	438,380 97
66,323 19	51,110 55	24,567 86	4,072 54	1,413 88	2,051 95	3,858 52	3,689 43
8,274 30	22,431 62	36,561 72	37,841 57	552 51	1,386 39	8,019 99	14,747 32
16,320 77	17,658 60	47,573 16	78,958 90	1,252 91	3,553 21	720 96	3,164 66
99,389 59	114,201 16	30,900 36	42,681 40	10,229 50	17,859 68	2,791 18	5,666 09
.....	1,186 12	210,000 00	185,000 00	.....	.....	.....	88 77
1,077,512 08	1,119,840 09	1,073,533 34	1,173,914 09	271,444 52	299,529 72	404,415 51	465,737 24
.....
.....
700,000 00	700,000 00	661,010 13	706,897 55	222,500 00	237,500 00	343,477 40	219,928 72
12,665 18	4,713 68	168,450 68	139,342 16	.....	3,544 29	50,664 05	10,000 00
.....	.....	.....	.....	16,452 58	.....	.....	.....
.....	.....	1,571 00	2,086 50	.....	2,276 50	375 00	213,884 09
.....
712,665 18	704,713 68	831,031 81	848,326 21	238,952 58	243,320 79	394,516 45	443,812 81
.....	.....	30,889 87	35,002 45	.....	.....	1,783 01	5,071 31
99,389 59	114,201 16	30,900 36	42,681 40	10,229 50	17,859 68	2,791 18	5,666 09
222,378 30	254,553 30	98,604 15	124,396 06	15,408 22	22,908 22	.....	5,157 50
43,079 01	46,371 95	82,107 15	123,507 97	6,854 22	15,441 03	5,324 87	6,029 53
1,077,512 08	1,119,840 09	1,073,533 34	1,173,914 09	271,444 52	299,529 72	404,415 51	465,737 24
.....
66.1	62.9	77.3	72.3	88.1	81.3	97.5	94.1

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality Population	Peterborough 20,426		Kitchener 19,266	
	1915	1916	1915	1916
ASSETS	\$ c.	\$ c.	\$ c.	\$ c.
Lands and Buildings	15,198 33	8,248 17	31,068 71	31,423 12
Sub-Station Equipment	12,824 50	12,824 50	72,450 20	70,216 45
Distribution System, Overhead.....	1,354 73	70,605 90	84,877 71	94,801 23
" " Underground..			6,785 40	6,864 35
Line Transformers.....	3,051 94	28,622 94	29,079 41	34,074 57
Meters.....	12,365 76	32,876 43	38,768 09	45,067 49
Street Light Equipment, Regular...	32 72	5,334 91	20,242 17	20,521 23
" " Ornamental.		26,107 68		
Miscel. Equip. and Construction Exp.	5,266 12	32,251 12	6,016 95	6,834 96
Steam or Hydraulic Plant.....				
Old Plant.....	136,050 95	11,789 42	56,879 74	55,952 40
Total Plant.....	173,320 55	228,661 07	346,168 38	365,755 80
Bank and Cash Balance.....		850 26	11,617 59	8,583 96
Inventories.....		2,898 98	6,371 06	5,960 22
Accounts Receivable.....	5,810 98	5,692 47	17,613 09	8,106 14
Sinking Fund.....	4,364 80	7,795 08		
Other Assets.....				17,730 42
Total Assets.....	183,496 33	245,897 86	381,770 12	406,136 54
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance.....	120,000 00	120,000 00	243,675 27	236,220 14
Accounts Payable.....	27,302 24	78,619 25	10,125 09	11,343 22
Bank Overdraft.....	10,665 48			
Other Liabilities.....	5,500 00	8,487 96		
Total Liabilities.....	163,467 72	207,107 21	253,800 36	247,563 36
Reserves				
Debentures Paid.....			56,474 73	63,929 86
Sinking Fund Reserve.....	4,364 80	7,795 08		
Depreciation Reserve.....	7,500 00	13,750 00	34,803 24	49,441 49
Surplus.....	8,163 81	17,245 57	36,691 79	45,201 83
Total Liabilities and Reserves....	183,496 33	245,897 86	381,770 12	406,136 54
Percentage of Net Debt to Total Assets	90.0	84.2	66.5	60.9

“ A ”—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

St. Catharines 17,880		St. Thomas 17,174		Stratford 17,081		Guelph 16,735	
1915	1916	1915	1916	1915	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1,492 42	1,492 42	12,351 59	29,463 54	23,597 29	23,977 25	19,400 41	19,547 56
5,276 84	11,407 86	35,337 54	41,382 42	21,409 13	21,180 71	40,571 05	59,022 65
68,349 25	99,137 55	67,507 25	69,620 45	85,523 21	90,347 88	56,657 84	48,565 40
1,383 80	.....	.....	862 95	.....	.....	.....	.....
9,245 24	26,101 39	13,373 59	13,984 50	14,726 43	15,357 80	9,966 00	12,687 97
11,031 05	22,828 57	24,058 50	27,151 73	23,722 21	27,791 74	22,836 82	31,279 81
6,501 94	7,625 55	12,050 48	12,234 32	5,971 43	5,980 95	25,553 60	25,350 34
.....	.....	6,749 83	6,767 16	22,175 22	22,725 24	.....	.....
19,896 25	22,773 94	6,423 66	7,023 16	7,848 12	7,848 12	6,777 76	6,919 76
.....	.....	.....	.....	.....	.....	a36,301 89	a36,132 81
75,554 13	41,351 25	4,289 96	2,795 84	11,187 00	10,927 00	.....	.....
198,730 92	232,718 53	182,122 40	211,286 07	216,160 04	226,136 69	218,065 37	239,506 30
25 00	10,513 39	22,597 51	32,627 98	408 17	8,244 03	17,752 16	11,793 31
986 60	1,840 26	1,879 27	3,275 27	2,759 65	2,199 76	12,374 40	17,559 32
2,821 50	2,752 90	10,960 39	9,086 15	13,178 01	479 93	7,646 42	7,655 01
4,219 31	6,667 03	.....	.....	13,553 36	17,751 59	15,741 28	18,619 72
.....	.....	86 25	138 57	3,243 74	.....	.....	.....
206,783 34	254,492 11	217,645 82	256,414 04	249,302 97	254,812 00	271,579 63	295,133 66
116,000 00	207,022 83	109,146 67	120,810 52	161,710 00	142,000 00	125,355 51	123,201 16
74,239 94	8,964 32	8,888 40	9,398 24	20,255 48	33,091 41	5,868 23	7,437 01
1,288 82	.....	.....	.....	7,319 21	.....	.....	.....
.....
191,528 76	215,987 15	118,035 07	130,208 76	189,284 69	175,091 41	131,223 74	130,638 17
.....	.....	23,937 76	27,273 91	24,090 00	28,470 00	19,644 48	21,798 83
4,219 31	6,667 03	.....	.....	13,553 36	17,751 59	15,741 28	18,619 72
8,100 00	18,600 00	56,662 04	66,462 04	22,374 92	29,874 92	58,546 12	69,279 03
2,935 27	13,237 93	19,010 95	32,469 33	.....	3,624 08	46,424 01	54,797 91
206,783 34	254,492 11	217,645 82	256,414 04	249,302 97	254,812 00	271,579 64	295,133 66
92.6	84.8	54.2	50.7	75.9	69.1	48.3	44.2

“ a ” Motors rented to consumers.

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality Population	Port Arthur 14,307		Chatham 12,863	
	1915	1916	1915	1916
—	\$ c.	\$ c.	\$ c.	\$ c.
ASSETS				
Lands and Buildings			18,320 18	22,144 44
Sub-Station Equipment	1,056 49		6,055 12	13,856 63
Distribution System, Overhead....	201,080 80		45,955 34	50,362 48
“ “ Underground				
Line Transformers.....	10,848 93	a	9,810 16	12,727 18
Meters.....	42,714 41		9,522 19	15,561 50
Street Light Equipment, Regular.	27,000 00		6,282 21	7,517 98
“ “ Ornamental			20,208 57	26,907 19
Miscel. Equip. and Construct'n Exp.	8,803 41		13,627 39	14,154 87
Steam or Hydraulic Plant.....	378,798 55	675,641 74		
Old Plant.....				
Total Plant.....	670,302 59	675,641 74	129,781 16	163,232 27
Bank and Cash Balance.....	13,363 06	6,834 64	691 84	25 00
Inventories.....	240 22	12,194 06	7,307 45	21,712 28
Accounts Receivable.....	26,178 99	98,690 26	1,308 20	3,797 92
Sinking Fund.....	68,476 51	81,537 46		
Other Assets.....	164 62	9,765 00	b 721 47	b 119 81
Total Assets.....	778,726 01	884,663 16	139,810 12	188,887 28
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance.....	568,758 70	559,403 71	88,861 60	87,654 90
Accounts Payable.....		34,170 24	26,147 08	62,712 49
Bank Overdraft.....			22,853 04	7,137 59
Other Liabilities.....	10,031 67	70,412 25	810 00	29,037 20
Total Liabilities.....	578,790 37	663,986 20	138,671 72	186,542 18
Reserves				
Debentures Paid.....	58,823 83	66,696 29	1,138 40	2,345 10
Sinking Fund Reserve.....	68,476 51	81,537 46		
Depreciation Reserve.....		12,283 82		
Surplus.....	72,635 30	60,159 39		
Total Liabilities and Reserves.	778,726 01	884,663 16	139,810 12	188,887 28
Percent'ge of Net Debt to Total Assets				98.8

"a" All plant included in total.

"b" Operating losses shown in italics.

“A”—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Owen Sound	Galt		Sarnia	Niagara Falls	Brockville
11,910	11,852		11,676	11,147	9,428
1916	1915	1916	1916	1916	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
24,446 80	12,201 05	12,286 30	96 06	14,183 10	27,079 01
9,626 38	22,082 47	26,104 06	5,900 11	22,165 31	.....
46,266 12	105,277 47	115,954 39	33,562 61	51,385 71	37,671 14
.....
11,001 65	17,795 56	19,488 11	10,253 97	28,952 40	10,258 61
20,853 60	28,938 43	31,975 55	1,446 43	30,107 74	12,778 36
6,788 66	8,484 27	8,501 57	2,281 53	9,542 43	11,448 52
500 00	50,697 06	50,703 11	410 06	16,000 00	.....
1,202 04	11,192 06	12,104 91	557 39	1,943 49	3,763 23
33,282 00	.....	.....	169,063 55	.....	51,948 00
.....	.....	.....	.....	7,772 00	.....
153,967 25	256,668 37	277,118 00	223,571 71	182,052 18	154,946 87
16,883 65	.....	.....	45,784 84	50 00	200 00
4,845 02	1,591 89	3,138 81	31 29	.....	3,484 08
2,062 43	.....	.....	.....	7,386 00	34,707 55
58,733 81	20,459 43	26,666 56	.....	.....	20,778 13
139 40	.....	.....	.....	973 41	1,367 94
236,631 56	278,719 69	306,923 37	269,387 84	190,461 59	215,484 57
.....
141,000 00	165,999 55	178,902 34	244,737 85	98,809 07	153,375 35
4,830 18	.....	.....	10,462 15	1,522 41	1,672 48
.....	39,483 55	40,001 97	.....	9,704 36	11,024 49
.....	.....	.....	.....	923 17	.....
145,830 18	205,483 10	218,904 31	255,200 00	110,959 01	166,072 32
.....	.....	.....	3,262 15	43,948 93	3,977 99
58,733 81	20,459 43	26,666 56	.....	.....	20,778 13
3,307 80	35,500 00	44,000 00	.....	7,945 00	7,000 00
28,759 77	17,277 16	17,352 50	10,925 69	27,608 65	17,656 13
236,631 56	278,719 69	306,923 37	269,387 84	190,461 59	215,484 57
61.6	73.7	71.3	94.6	58.2	77.2

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Woodstock		Welland	
Population	10,084		7,243	
—	1915	1916	1915	1916
ASSETS	\$ c.	\$ c.	\$ c.	\$ c.
Lands and Buildings	7,331 95	7,331 95	6,503 78	6,550 39
Sub-Station Equipment	27,685 13	27,685 13	15,846 88	16,185 58
Distribution System, Overhead.....	36,335 71	38,264 67	43,624 07	47,636 88
“ “ Underground.....	.....	.....	.....	.....
Line Transformers.....	20,173 06	20,635 31	11,743 46	12,605 44
Meters.....	16,994 24	18,492 45	8,549 11	8,755 87
Street Light Equipment, Regular...	10,328 77	10,450 67	2,269 59	2,305 19
“ “ Ornamental.....	.....	.....	.....	.....
Miscel. Equip. and Construction Exp.....	.....	.....	7,348 74	7,348 74
Steam or Hydraulic Plant.....	15,743 62	15,835 26	.....	.....
Old Plant.....	15,835 26	15,743 62	.....	.....
Total Plant.....	150,427 74	154,439 06	95,885 63	101,388 09
Bank and Cash Balance.....	13,953 07	1,796 60	1,803 40	3,630 67
Inventories.....	113 12	525 33	.....	2,753 28
Accounts Receivable.....	.....	.....	16,936 34	33,899 06
Sinking Fund.....	36,347 74	40,296 29	3,566 00	5,170 70
Other Assets.....	1,500 00	23,000 00	.....	.....
Total Assets.....	202,341 17	220,057 28	118,191 37	146,841 80
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance.....	107,385 63	107,385 63	90,000 00	90,000 00
Accounts Payable.....	.....	.....	16,322 18	32,852 15
Bank Overdraft.....	.....	.....	.....	.....
Other Liabilities.....	.....	.....	.....	.....
Total Liabilities.....	107,385 63	107,385 63	106,322 18	122,852 15
Reserves				
Debentures Paid.....	.....	.....	.....	.....
Sinking Fund Reserve.....	36,347 24	40,296 29	3,566 00	5,170 70
Depreciation Reserve.....	22,483 98	29,414 18	4,425 00	8,425 00
Surplus.....	36,124 32	42,961 18	3,878 19	10,393 95
Total Liabilities and Reserves....	202,341 17	220,057 28	118,191 37	146,841 80
Percentage of Net Debt to Total Assets	53.1	48.8	90.0	83.7

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality Population	Walkerville 5,096		Waterloo 4,956	
	1915	1916	1915	1916
ASSETS	\$ c.	\$ c.	\$ c.	\$ c.
Lands and Buildings	16,837 66	16,917 78	4,740 85	5,142 20
Sub-Station Equipment	18,154 62	19,133 82	18,146 58	19,502 40
Distribution System, Overhead.....	17,078 32	18,979 67	35,280 24	36,959 55
“ “ Underground.....				
Line Transformers.....	14,002 76	14,182 87	8,992 44	9,240 38
Meters.....	15,990 97	14,891 76	9,566 70	10,823 75
Street Light Equipment, Regular... “ “ Ornamental. d	15,403 42	45,876 33	5,191 76	5,229 63
Miscel. Equip. and Construction Exp. Steam or Hydraulic Plant.....	15,403 42	16,272 91	1,266 56	2,933 16
Old Plant.....	18,556 21	2,483 64	2,483 64	2,483 64
	39,753 34	18,509 77	9,666 15	9,666 15
Total Plant.....	137,221 09	183,321 12	95,334 92	101,980 86
Bank and Cash Balance.....	590 60	50 00	37 27	
Inventories.....		10,418 98	1,559 42	2,583 41
Accounts Receivable.....	7,717 87	14,880 78	5,206 24	3,401 83
Sinking Fund.....			1,728 00	2,016 00
Other Assets.....				2,137 05
Total Assets.....	145,529 56	208,670 88	103,865 85	112,119 15
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance.....	93,156 89	90,907 37	62,915 67	61,838 48
Accounts Payable.....	43,362 27	39,029 53	1,440 00	1,656 29
Bank Overdraft.....		4,639 37		2,144 89
Other Liabilities.....	266 78	m 50,639 41		
Total Liabilities.....	136,785 94	185,215 68	64,355 67	65,639 66
Reserves				
Debentures Paid.....	3,102 11	5,351 63	3,084 33	4,161 52
Sinking Fund Reserve.....			1,728 00	2,016,00
Depreciation Reserve.....		3,773 06	15,450 00	19,150,00
Surplus.....	5,641 51	14,330 51	19,247 85	21,151,97
Total Liabilities and Reserves....	145,529 56	208,670 88	103,865 85	112,119 15
Percentage of Net Debt to Total Assets	94.0	88.8	63.5	58.5

“A ”—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Goderich 4,655		Dundas 4,652		Preston 4,643		Paris 4,370	
1915	1916	1915	1916	1915	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
12,915 81	12,915 81	2,803 50	8,227 20	.....	.....	7,626 26	7,626 26
7,266 83	9,943 24	6,527 27	4,741 17	13,667 48	13,676 42	10,944 83	10,944 83
24,131 48	28,440 55	38,889 98	39,519 25	36,090 52	39,573 54	30,608 45	31,517 91
.....
6,587 57	6,581 72	7,851 91	9,556 93	12,800 35	13,501 69	4,491 51	5,258 11
9,970 58	10 327 51	7,226 28	8,522 81	11,085 14	12,301 42	6,467 62	7,289 38
4,495 29	4,915 52	1,708 67	1,740 34	2,561 53	2,743 78	2,114 05	2,114 05
.....
1,967 26	3,990 81	5,984 67	5,840 41	5,255 35	6,294 12	210 04	210 04
.....	.....	.....	.....	.....	.....	15,000 00	.....
9,230 65	8,231 05	2,110 38	1,960 38	23,549 22	23,549 22	19,275 66	19,271 46
.....
76,565 47	85,346 21	73,102 66	80,108 49	105,009 59	111,640 19	96,738 42	84,232 04
.....
161 43	8,053 02	.....	.....	.....	.....	.....	.....
232 87	375 81	1,810 49	1,250 09	812 11	1,472 60	41 32	22,13
7,375 10	2,929 34	.....	2,834 68	5,139 61	4,603 14	.....	75,12
2,767 40	2,883 30	.....	.....	.....	.....	4,353 17	6,857 22
.....	.....	.....	.....	.....	183 80	.....	.....
87,102 27	99,587 68	74,913 15	84,193 26	110,961 31	117,899 73	101,132 91	91,186 51
.....
.....
52,925 75	51,233 87	50,905 67	50,039 67	67,984 96	64,769 69	62,588 88	55,049 42
.....	8,130 24	.....	.....	2,073 75	1,575 44	.....	.....
.....	.....	11,155 46	13,764 99	8,735 25	13,813 32	160 70	2,219 66
.....	.....	.....	.....	.....	.....	4,196 87	.....
52,925 75	59,364 11	62,061 13	63,804 66	78,793 96	80,158 45	66,946 45	57,269 08
.....
3,162 30	4,854 18	2,094 33	2,960 33	9,880 55	13,095 82	29,411 12	21,950 58
2,767 40	2,883 30	.....	.....	.....	.....	4,353 17	6,857 22
6,670 00	9,270 00	7,083 00	9,149 00	13,548 34	17,048 34	.....	2,000 00
21,576 82	23,216 09	3,674 69	8,279 27	8,738 46	7,597 12	422 17	3,109 63
87,102 27	99,587 68	74,913 13	84,193 26	110,961 31	117,899 73	101,132 91	91,186 51
.....
60.7	59.6	82.3	75.8	71.0	68.0	66.3	62.8

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality Population	Wallaceburg 4,107		Simcoe 4,061	
	1915	1916	1915	1916
	\$ c.	\$ c.	\$ c.	\$ c.
ASSETS				
Lands and Buildings	1,753 84	3,876 29	1,486 55	1,496 75
Sub-Station Equipment .....	.....	760 50	3,668 01	5,851 99
Distribution System, Overhead.....	10,401 94	18,935 55	17,194 16	17,330 44
" " Underground..	.....	.....	.....	.....
Line Transformers.....	1,799 07	3,687 92	1,786 07	2,270 87
Meters.....	2,931 10	6,574 53	1,117 47	1,534 55
Street Light Equipment, Regular...	70 55	1,568 81	1,478 85	1,478 85
" " Ornamental.	.....	.....	1,181 83	1,181 83
Miscel. Equip. and Construction Exp.	2,302 41	3,229 32	3,140 28	3,662 16
Steam or Hydraulic Plant.....	.....	.....	.....	.....
Old Plant.....	26,017 56	25,884 42	931 92	927 92
Total Plant.....	45,276 47	62 517 34	31,985 14	35,735 36
Bank and Cash Balance.....	.....	.....	4,636 00	5,222 56
Inventories.....	784 15	3,515 34	395 45	86 00
Accounts Receivable.....	1,276 81	2,874 81	789 90	789 90
Sinking Fund.....	.....	.....	.....	.....
Other Assets.....	.....	.....	.....	.....
Total Assets.....	47,337 43	68,907 49	37,806 49	41,833 82
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance.....	44,389 16	43,744 15	35,434 90	35,434 90
Accounts Payable.....	1,229 34	21,362 02	281 46	866 14
Bank Overdraft.....	569 54	1,223 19	.....	.....
Other Liabilities.....	450 00	100 00	.....	3,500 00
Total Liabilities.....	46,638 04	66,429 36	35,716 36	39,801 04
Reserves				
Debentures Paid.....	610 84	1,255 85	.....	.....
Sinking Fund Reserve.....	.....	.....	.....	.....
Depreciation Reserve.....	.....	1,038 00	.....	1,350 00
Surplus.....	88.55	184 28	2,090 13	682 78
Total Liabilities and Reserves....	47,337 43	68,907 49	37,806 49	41,833 82
Percentage of Net Debt to Total Assets	98.5	96.4	94.4	95.1

“A”—Continued
of Hydro Municipalities as at December 31st, 1915 and 1916

Brampton 4,041		St. Mary's 3,960		Penetanguishene 3,928		Petrolia 3,891
1915	1916	1915	1916	1915	1916	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
3,808 08	3,808 08	13,674 27	13,674 27	2,151 00	2,151 00	.....
5,200 25	8,995 62	13,002 74	11,837 64	3,507 71	3,507 71	2,360 59
31,951 88	31,947 38	22,025 40	23,365 50	24,333 58	24,811 72	14,897 59
.....
9,141 24	10,039 24	10,695 83	11,907 19	3,846 07	4,535 87	3,824 69
9,403 89	9,651 13	12,709 33	13,311 59	5,191 76	5,408 94	4,143 66
1,799 02	1,805 73	5,049 39	5,888 52	1,721 95	1,721 95	818 01
.....	.....	.....	.....	.....	.....	3,864 07
2,904 61	2,904 61	1,713 53	2,084 77	278 93	278 93	3,903 29
.....
15,000 00	15,000 00	.....	.....	2,874 00	2,874 00	8,740 44
.....
79,208 97	84,151 79	78,870 49	82,069 48	43,905 00	45,290 12	42,552 34
.....
5,663 24	1,800 14	3,430 53	4,033 61	.....	.....	.....
129 84	360 33	1,207 66	1,598 94	513 50	533 09	1,746 96
.....	3,552 08	1,685 00	1,685 00	3,659 27	2,932 05	.....
.....	.....	1,594 91	2,140 51	.....	.....	.....
.....
85,002 05	89,864 34	86,788 59	91,527 54	48,077 77	48,755 26	44,299 30
.....
.....
63,070 87	61,180 02	42,635 27	40,275 79	28,197 45	27,505 90	34,516 80
.....	.....	5,980 63	7,526 39	.....	.....	7,573 21
.....	.....	.....	.....	1,712 04	215 16	1,655 26
.....	.....	.....	.....	.....	300 00	.....
.....
63,070 87	61,180 02	48,615 90	47,802 18	29,909 49	28,021 06	43,745 27
.....
5,979 77	7,870 62	20,611 75	22,971 23	2,802 55	3,494 10	483 20
.....	.....	1,594 91	2,140 51	.....	.....	.....
11,200 00	14,200 00	6,940 00	9,840 00	7,445 00	9,225 00	.....
4,751 41	6,613 70	9,026 03	8,773 62	7,920 73	8,015 10	70 83
.....
85,002 05	89,864 34	86,788 59	91,527 54	48,077 77	48,755 26	44,299 30
.....
74.2	68.1	56.0	52.2	62.2	57.5	98.8

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Tillsonburg		Strathroy	
Population	3,084		2,998	
—	1915	1916	1915	1916
ASSETS	\$ c.	\$ c.	\$ c.	\$ c.
Lands and Buildings	1,974 27	1,974 27	1,070 00	1,070 00
Sub-Station Equipment	6,818 47	6,818 47	4,175 40	4,691 16
Distribution System, Overhead.....	18,252 15	19,135 69	15,841 42	16,649 55
“ “ Underground.....	.....	.....	.....	.....
Line Transformers.....	4,041 90	3,408 92	3,211 14	3,460 85
Meters.....	4,638 91	5,016 13	3,534 75	4,731 00
Street Light Equipment, Regular...	1,762 50	1,762 50	1,463 28	1,499 14
“ “ Ornamental.....	.....	.....	.....	.....
Miscel. Equip. and Construction Exp.	918 83	918 83	555 15	578 15
Steam or Hydraulic Plant.....	.....	.....	.....	.....
Old Plant.....	.....	.....	12,824 13	12,343 15
Total Plant.....	38,407 03	39,034 81	42,675.27	45,023 00
Bank and Cash Balance.....	3,804 89	5,587 50	3,496 96	3,602 89
Inventories.....	1,271 84	3,104 63	152 66	4,523 64
Accounts Receivable.....	3,331 74	1,584 87	.....	.....
Sinking Fund.....	880 26	1,337 49	.....	.....
Other Assets.....	.....	.....	.....	.....
Total Assets.....	47,695 76	50,649 30	46,324 89	53,149 53
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance.....	33,605 10	32,895 86	15,486 92	44,698 73
Accounts Payable.....	700 00	727 12	26,941 40	536 95
Bank Overdraft.....	.....	.....	.....	.....
Other Liabilities.....	.....	.....	.....	.....
Total Liabilities.....	34,305 10	33,622 98	42,428 32	45,235 68
Reserves				
Debentures Paid.....	2,394 90	3,104 14	745 08	1,533 27
Sinking Fund Reserve.....	880 26	1,337 49	.....	.....
Depreciation Reserve.....	6,311 50	7,911 50	1,500 00	2,550 00
Surplus.....	3,804 00	4,673 19	1,651 49	3,830 58
Total Liabilities and Reserves....	47,695 76	50,649 30	46,324 89	53,149 53
Percentage of Net Debt to Total Assets	71.9	66.4	91.6	84.7

“A”—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Hespeler 2,740		Prescott 2,740		Orange- ville 2,493	Listowel 2,326	Ridge- town 2,329	Elmira 2,270	
1915	1916	1915	1916	1916	1916	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
3,499 23	3,499 23	2,753 04	2,761 54	100 00	.....	.....	.....	.....
8,471 64	8,502 78	.....	.....	.....	.....	889 26	.....	.....
6,686 61	7,171 70	23,886 23	24,405 64	13,330 35	3,582 31	8,780 65	9,009 28	9,747 18
.....
4,880 87	4,886 87	5,028 61	5,468 06	707 67	2,123 63	1,789 62	2,317 42	2,396 92
4,175 69	4,583 14	7,354 45	7,523 11	919 46	2,698 72	1,949 33	2,550 46	2,686 73
815 07	1,009 68	1,288 30	1,316 52	784 65	1,686 20	823 17	578 29	607 84
.....
93 08	93 08	1,118 53	1,127 53	431 39	897 33	1,030 89	2,076 74	2,076 74
.....	.....	12,108 35	12,108 35	.....	20,261 59	373 35	.....	.....
3,000 00	3,000 00	.....	.....	11,849 50	.....	8,066 14	2,296 27	2,295 52
.....
31,622 19	32,746 48	53,537 51	54,710 75	28,123 02	31,249 78	23,702 41	18,828 46	19,810 93
.....
2,522 35	3,835 89	.....	296 25	.....	1,695 16	3,064 20	5,000 25	6,196 10
.....	.....	.....	.....	974 16	2,501 94	989 55	96 03	123 28
184 33	246 68	441 53	588 72	730 53	1,108 05	341 00	189 85	61 32
.....	.....	460 00	617 92	.....	.....	.....	.....	.....
b 1108 06	.....	.....	.....	.....	4,925 89	.....	.....	.....
.....
35,436 93	36,829 05	54,439 04	56,213 64	29,827 71	41,480 82	28,097 16	24,064 59	26,191 63
.....
.....
26,720 76	24,909 72	22,548 34	21,862 15	28,286 12	34,178 52	18,759 89	19,494 04	19,241 06
141 42	838 19	350 00	.....	1,296 91	442 68	.....	.....	.....
.....	.....	115 78	.....	.....	.....	1,225 12	.....	.....
.....	.....	.....	.....	.....	1,348 66	1,319 10	.....	.....
.....
26,862 18	25,747 91	23,014 12	21,862 15	29,583 03	35,969 86	21,304 11	19,494 04	19,241 06
.....
.....
5,849 75	7,660 79	1,431 00	2,117 19	.....	1,411 37	696 10	505 96	758 94
.....	.....	460 00	617 92	.....	.....	.....	.....	.....
2,725 00	3,403 56	1,950 00	5,830 00	.....	.....	425 00	1,400 00	2,020 00
.....	16 79	27,583 92	25,786 38	244 68	4,099 59	5,671 95	2,664 59	4,171 63
.....
35,436 93	36,829 05	54,439 04	56,213 64	29,827 71	41,480 82	28,097 16	24,054 59	26,191 63
.....
75.7	69.9	42.3	38.9	99.2	86.7	75.8	81.0	73.4

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality Population	Clinton 2,177		Weston 2,156		Milton 2,072	
—	1915	1916	1915	1916	1915	1916
ASSETS	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Lands and Buildings			3,230 94	3,230 94		
Sub-Station Equipment ..	7,738 47	7,738 47	4,985 23	5,450 72	5,550 19	5,550 19
Dist. System, Overhead...	10,391 70	10,719 10	11,875 08	13,525 06	10,354 52	10,354 52
“ Underground..						
Line Transformers.....	2,139 79	2,496 79	4,871 82	5,680 72	1,881 05	1,966 05
Meters.....	2,683 27	2,865 04	3,848 68	4,260 69	3,126 86	3,282 59
Street Light Equip. Regular	206 41	206 41	1,914 16	1,936 66	935 43	935 43
“ Ornamental.....						
Miscel. Equip. and Con.Exp.	3,310 45	3,310 45	2,831 67	2,833 77	2,486 23	2,486 23
Steam or Hydraulic Plant						
Old Plant.....	13,456 00	12,085 32			4,344 48	4,065 85
Total Plant.....	39,926 09	39,421 58	33,557 58	36,918 56	28,678 76	28,640 86
Bank and Cash Balance..	392 93	1,329 56		878 60	1,171 63	3,553 37
Inventories.....	736 86	1,697 68	117 23	72 89	1,882 83	2,468 43
Accounts Receivable.....	71 67	71 67	1,344 16	4,689 88	2,737 21	3,924 16
Sinking Fund.....	1,584 80	2,557 29	2,096 65			
Other Assets.....						
Total Assets.....	42,712 35	45,077 78	37,175 62	42,559 93	34,470 43	38,586 82
LIABILITIES AND RESERVES						
Liabilities						
Debenture Balance.....	40,500 00	40,500 00	17,234 76	16,492 60	21,274 54	19,982 95
Accounts Payable.....	247 35		1,449 79	3,181 50		
Bank Overdraft.....						
Other Liabilities.....			1,350 57			300 00
Total Liabilities.....	40,747 35	40,500 00	20,035 12	19,674 10	21,274 54	20,282 95
Reserves						
Debentures Paid.....			2,733 12	3,475,28	3,438 44	4,730 03
Sinking Fund Reserve...	1,584 80	2,557 29				
Depreciation Reserve.....	380 20	1,200 00	5,620 00	7,220 00	3,240 00	4,140 00
Surplus.....		820 49	8,787 38	12,190 55	6,517 45	9,433 84
Total Liabilities and Reserves....	42,712 35	45,077 78	37,175 62	42,559 93	34,470 43	38,586 82
Percentage of Net Debt to Total Assets	95.4	89.9	53.9	46.2	61.7	52.5

"A"—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Mimico 1,976		Chesley 1,975	Seaforth 1,964		Mount Forest 1941	Georgetown 1,905	
1915	1916	1916	1915	1916	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
98 30	98 30	.....	1,203 25	1,204 53	3,725 00	12 00	12 00
16,958 20	18,953 45	585 17	6,031 75	6,031 75	686 75	13,646 65	15,996 12
1,592 62	2,210 37	1,312 85	3,212 30	4,086 58	1,926 64	5,233 91	6,471 35
4,953 01	5,935 62	1,864 28	3,642 67	3,992 92	2,307 58	3,564 24	4,104 95
1,022 20	1,022 20	816 26	797 34	805 25	1,655 77	956 14	956 14
1,355 99	1,308 49	2,612 12	355.98	355 98	876 07	1,184 25	1,193 20
.....	.....	5,509 60	.....	.....	4,059 92	2,209 80	2,209 80
25,980 32	29,528 43	26,572 69	29,943 62	31,464 20	29,055 35	26,806 99	30,943 56
459 59	1,207 29	.....	628 68	1,396 83	1,335 00	994 45	1,049 53
133 03	20 00	350 00	2,686 32	2,744 57	509 42	608 73	824 87
531 59	656 29	780 57	130 57	132 95	669 83	457 38	432 92
.....	.....	.....	1,892 86	2,414 32	.....	.....	.....
27,104 53	31,412 01	27,703 17	35,282 05	38,152 87	31,569 60	28,867 55	33,250 88
16,858 35	18,868 36	21,854 71	25,000 00	25,000 00	17,576 36	19,478 86	19,194 59
3,458 89	3,608 40	4,429 51	.....	.....	7,307 02	306 80	.....
.....	.....	179 96	.....	.....	.....	.....	.....
20,317 24	21,976 76	26 464 18	25,000 00	25,000 00	24,883 38	19,785 66	19,194 59
1,141 65	1,631 64	645 29	.....	.....	4,423 64	512 14	805 41
2,860 00	3,860.00	.....	1,892 86	2,414 32	.....	.....	.....
2,785 64	3,943.61	593 70	4,150 00	5,375 00	615 00	2,430 00	3,640.00
27,104 53	31,412 01	27,703 17	4,239 19	5,363 55	1,647 58	6,130 75	9,610.88
74.9	70.0	95.5	70.8	65.5	78.5	68.5	57.7

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Palmerston	Fergus	Tilbury
Population	1,843	1,776	1,740
—	1916	1915	1916
ASSETS	\$ c.	\$ c.	\$ c.
Lands and Buildings			957 46
Sub-Station Equipment	691 88		
Distribution System, Overhead.....	5,611 28	8,144 42	5,268 42
" " Underground.....		8,988 86	5,303 84
Line Transformers.....	1,620 66	2,074 38	2,434 47
Meters.....	1,435 43	2,109 83	2,515 02
Street Light Equipment, Regular..	489 49	826 27	826 27
" " Ornamental.....			176 35
Miscel. Equip. and Construction Exp.	672 47	543 57	562 37
Steam or Hydraulic Plant.....	12,429 55		893 10
Old Plant.....		2,546 59	2,440 33
Total Plant.....	22,950 76	16,245 06	17,767 32
Bank and Cash Balance.....			13,202 72
Inventories.....	1,985 05	2,750 83	2,546 59
Accounts Receivable.....	5,741 25		129 87
Sinking Fund.....			40 91
Other Assets.....			313 03
Total Assets.....	30,677 06	18,995 89	20,626 99
LIABILITIES AND RESERVES			
Liabilities			
Debenture Balance.....	14,736 87	15,779 11	15,546 07
Accounts Payable.....	5,225 48		9,873 52
Bank Overdraft.....	207 71	1,483 32	5,350 46
Other Liabilities.....			8 31
Total Liabilities.....	20,170 06	17,262 43	15,911 88
Reserves			
Debentures Paid.....	7,263 13	220 89	453 93
Sinking Fund Reserve.....			126 48
Depreciation Reserve.....	295 00	650 00	1,150 00
Surplus.....	2,948 87	862 57	3,111 18
Total Liabilities and Reserves....	30,677 06	18,995 89	20,626 99
Percentage of Net Debt to Total Assets	65.8	90.8	77.1
			97.6
			93.3

"A"—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Acton 1,735		Gravenhurst 1,702	Mitchell 1,687		Durham 1,600	Exeter 1,572
1915	1916	1916	1915	1916	1916	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1,500 00	1,500 00	12,258 29	4,550 44	4,796 10	.....	.....
597 62	597 62	11,074 20	9,034 86	9,034 86	584 88	.....
4,839 74	5,142 52	25,870 73	7,631 03	8,119 67	11,917 19	11,693 79
.....
1,696 50	2,164 50	578 25	1,113 82	1,113 82	971 92	1,494 04
2,109 15	2,391 48	3,632 16	2,564 87	2,827 43	1,059 18	2,276 12
896 21	896 21	.....	978 00	1,063 55	699 56	721 38
.....
777 99	777 99	1,542 00	.....	.....	547 24	1,451 48
.....	.....	.....	1,500 00	1,500 00	.....	.....
3,510 85	3,510 85	.....	.....	.....	2,300 00	.....
.....
15,928 06	16,981 17	54,955 63	27,373 02	28,455 43	18,079 97	17,636 81
.....
2,200 50	2,726 25	590 79	1,354 31	.....	213 04	.....
276 03	654 33	1,173 19	800 00	945 38	.....	546 70
.....	.....	2,374 24	337 97	2,385 79	.....	457 20
4,156 00	4,358 00	2,569 73	.....	.....	.....	.....
.....	.....	81,952 92	.....	.....	<i>b 103 41</i>	.....
.....
22,560 59	24,719 75	143,616 50	29,865 30	31,786 60	18,396 42	18,640 71
.....
.....
13,973 03	13,689 62	95,853 05	8,816 25	9,919 45	12,646 61	17,240 08
322 00	322 00	379 73	993 33	450 00	5,396 42	378 87
.....	.....	.....	.....	986 85	.....	65 92
.....	.....	25,093 20	.....	.....	.....	.....
.....
14,295 03	14,011 62	121,325 98	9,809 58	11,356 30	18,043 03	17,684 87
.....
526 97	810 38	17,596 21	6,036 53	7,375 77	353 39	419 05
4,156 00	4,358 00	2,337 94	.....	.....	.....	.....
1,500 00	2,000 00	1,650 00	4,377 21	5,377 21	.....	.....
2,082 59	3,539 75	706 37	9,641 98	7,677 32	.....	536 79
.....
22,560 59	24,719 75	143,616 50	29,865 30	31,786 60	18,396 42	18,640 71
.....
63.4	56.6	84.5	32.8	35.7	.....	95.4

"b" Operating losses shown in italics.

"A"—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Victoria Harbor 1,477	Blenheim 1,424	Harriston 1,404	Pt. Dalhousie 1,318		Caledonia 1,217		Norwich 1,189	
1916	1916	1916	1915	1916	1915	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
.....	909 64	600 00	.....	.....	.....	.....	910 40	910 40
4,727 86	9,543 23	6,948 25	3,273 52	3,658 63	4,651 20	4,881 97	6,504 04	6,708 36
600 00	1,330 76	1,740 00	1,792 00	2,541 43	391 65	565 65	1,149 41	1,541 12
1,154 47	2,085 93	1,915 66	2,124 13	3,647 85	761 27	947 44	2,293 66	2,476 93
127 81	823 67	350 00	268 67	268 67	349 62	441 49	546 06	546 06
.....	1,475 64	.....	.....	.....	.....	.....	.....	1,811 96
642 64	568 06	413 73	1,081 66	1,093 66	473 20	473 20	963 17	969 34
.....	.....	2,062 15	6,325 50	6,325 50	.....	.....	3,509 82	3,509 82
7,252,78	16,736 93	14,029 79	14,865 48	17,535 74	6,626 94	7,309 75	15,876 56	18,473 99
208 74	836 08	122 98	.....	50 03	217 29	419 20	2,261 99	494 65
.....	.....	671 00	385 50	89 76	.....	.....	2,038 83	1,903 54
.....	151 78	966 00	712 08	181 21	.....	.....	672 30	1,755 04
.....	.....	b 23 35	.....	.....	.....	.....	455 90	.....
7,461 52	17,724 79	15,818 12	15,963 06	17,856 74	6,844 23	7,728 95	21,305 58	22,627 22
6,313 59	13,822 92	12,846 89	12,500 00	12,121 97	4,539 72	4,450 40	12,963 89	12,717 24
.....	1,737 78	2,155 09	1,953 12	1,913 12	50 05	90 05	901 19	1,333 64
.....	.....	.....	42 20	2,060 00	.....	.....	.....	.....
6,313 59	15,560 70	15,001 98	14,495 32	16,095 09	4,589 77	4,540 45	13,865 08	14,050 88
186 41	177 08	471 14	.....	378 03	84 28	173 60	792 11	1,038 76
.....
190 00	440 00	345 00	1,279 02	1,279 02	810 00	1,070 00	2,225 00	3,595 00
771 52	1,547 01	.....	188 72	104 60	1,360 18	1,944 90	4,423 39	3,942 58
7,461 52	17,724 79	15,818 12	15,963 06	17,856 74	6,844 23	7,728 95	21,305 58	22,627 22
84.6	87.9	94.8	90.8	90.1	67.6	58.8	65.1	62.1

“A”—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Elora 1,115			Hagersville 1,105		Winchester 1,065		Port Credit 944	
1914	1915	1916	1915	1916	1915	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
.....	.....	.....	.....	.....	224 15	224 15	675 00	675 00
6,138 53	7,189 83	7,539 37	6,493 43	6,678 90	7,225 62	7,319 95	7,613 47	8,313 48
803 21	1,250 05	1,791 53	1,078 27	1,203 27	481 86	665 86	722 48	812 48
1,068 18	1,391 03	1,564 27	1,865 83	2,021 32	1,014 44	1,241 04	1,826 78	1,851 63
438 33	438 33	438 33	415 55	435 35	564 98	564 98	294 99	324 63
839 00	908 18	926 18	101 80	101 80	264 14	275 54	614 26	626 31
2,100 00	1,482 85	1,408 35	.....	.....	1,100 00	1,100 00	.....	.....
11,387 25	12,661 27	13,668 03	9,954 88	10,440 64	10,875 19	11,391 52	11,746 98	12,603 53
10 34	30 21	642 51	1,066 60	2,829 55	1,621 20	1,236 43	986 91	645 28
342 12	576 62	1,034 54	165 71	67 77	881 74	1,476 81	.....	.....
.....	.....	42 21	.....	.....	.....	.....	180 00	180 00
.....
11,739 71	13,268 10	15,387 29	11,187 19	13,337 96	13,378 13	14,104 76	12,913 89	13,428 81
9,790 48	9,570 48	12,339 48	7,754 37	7,591 30	10,515 30	10,372 52	7,013 39	7,876 16
1,709 52	2,639 52	534 52	.....	.....	200 00	.....	1,495 16	226 02
.....
11,500 00	12,210 00	12,874 00	7,754 37	7,591 30	10,715 30	10,372 52	8,508 55	8,102 18
209 52	429 52	660 52	245 63	408 70	134 70	277 48	486 61	623 84
.....
.....	460 00	835 00	925 00	1,305 00	965 00	1,335 00	1,581 00	2,051 00
30 19	168 58	1,017 77	2,262 19	4,032 96	1,563 13	2,119 76	2,337 73	2,651 79
11,739 71	13,268 10	15,387 29	11,187 19	13,337 96	13,378 13	14,104 76	12,913 89	13,428 81
97.1	92.0	83.7	69.0	56.9	80.1	73.5	66.0	60.3

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality Population	Beaverton 1,015		Markdale 989	Stayner 972	
—	1915	1916	1916	1915	1916
ASSETS	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Lands and Buildings	250 00	250 00	.....	.....	.....
Sub-Station Equipment .....	.....	.....	780 80	200 00	200 00
Dist. System, Overhead.....	5,912 64	5,901 74	5,983 31	3,467 35	7,530 29
“ “ Underground.....	.....	.....	.....	.....	.....
Line Transformers	470 75	470 75	378 50	959 03	1,350 14
Meters	1,720 22	1,836 96	841 94	875 08	1,224 79
Street Light Equip., Regular	453 44	453 44	522 62	386 31	478 16
“ “ Ornamental .....	.....	.....	.....	.....	.....
Miscel. Equip. and Con. Exp.	1,141 32	1,141 32	549 06	128 40	287 77
Steam or Hydraulic Plant.....	.....	.....	.....	.....	.....
Old Plant	3,787 92	3,787 92	2,080 65	4,490 15	4,213 01
Total Plant	13,736 29	13,842 13	11,136 88	10,506 32	15,284 16
Bank and Cash Balance ...	865 12	441 27	72 44	641 00	861 70
Inventories	403 42	213 40	2,230 68	66 44	51 19
Accounts Receivable .....	.....	.....	.....	.....	416 47
Sinking Fund .....	.....	.....	.....	.....	.....
Other Assets .....	.....	.....	.....	.....	.....
Total Assets	15,004 83	14,496 80	13,440 00	11,213 76	16,613 52
LIABILITIES AND RESERVES					
Liabilities					
Debenture Balance	9,691 45	9,525 51	8,886 16	8,221 10	12,929 70
Accounts Payable	5,004 83	4,496 80	3,236 98	1,072 16	1,009 66
Bank Overdraft .....	.....	.....	.....	.....	.....
Other Liabilities .....	.....	.....	.....	.....	.....
Total Liabilities	14,696 28	14,022 31	12,123 14	9,293 26	13,939 36
Reserves					
Debentures Paid	308 55	474 49	113 84	778 90	1,070 30
Sinking Fund Reserve .....	.....	.....	.....	.....	.....
Depreciation Reserve .....	.....	.....	.....	415 00	695 00
Surplus .....	.....	.....	1,203 02	726 60	908 86
Total Liabilities and Reserves	15,004 83	14,496 80	13,440 00	11,213 76	16,613 52
Percentage of Net Debt to Total Assets		100.0	90.2	82.7	83.9

“A”—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Cannington 903		Milverton 893	Dutton 870		Port Stanley 849		Chesterville 854	
1915	1916	1916	1915	1916	1915	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
.....	.....	206 00	.....	.....	1,505 37	1,505 38	.....	.....
6,112 21	6,227 12	5,266 42	5,086 66	5,124 93	9,322 94	9,509 81	5,058 44	4,958 20
930 38	1,017 63	783 10	617 24	778 24	1,495 56	1,495 56	401 48	1,002 48
1,533 22	1,797 14	773 09	1,377 84	1,599 88	1,960 26	1,960 26	977 19	1,082 96
492 98	533 48	505 36	441 01	441 01	570 60	570 60	306 46	306 46
367 58	367 58	161 84	258 88	256 99	5,517 16	5,517 16	552 68	552 68
3,699 37	3,609 37	.....	.....	.....	1,000 00	975 00	.....	.....
13,135 74	13,552 32	7,695 81	7,781 63	8,201 05	21,371 90	21,533 77	7,296 25	7,902 78
1,034 58	355 01	102 54	427 02	1,766 37	4,495 30	5,551 04	383 85	100 25
649 78	668 00	141 30	394 74	79 50	.....	.....	578 75	671 31
170 62	247 40	2,000 00	.....	.....	.....	.....	.....	128 97
.....	.....	.....	.....	.....	.....	.....	b 54 47	.....
14,990 72	14,822 83	9,939 65	8,603 39	10,046 92	25,867 20	27,084 81	8,313 32	8,803 31
11,834 35	11,659 58	9,227 50	8,407 49	8,407 49	17,487 16	17,128 79	4,858 20	4,781 40
2,991 72	2,822 73	405 93	.....	.....	20 00	30 00	2,807 38	2,382 49
.....	.....	.....	.....	.....	.....	.....	.....	334 94
.....	.....	.....	.....	.....	.....	.....	258 44	120 00
14,826 07	14,482 31	9,633 43	8,407 49	8,407 49	17,507 16	17,158 79	7,924 02	7,618 83
165 65	340 42	272 50	.....	.....	1,462 84	1,821 21	141 80	218 60
.....	.....	.....	.....	240 00	3,078 08	3,743 08	247 50	622 50
.....	.....	33 72	195 90	1,399 43	3,819 12	4,361 73	.....	343 38
14,990 72	14,822 73	9,939 65	8,603 39	10,046 92	25,867 20	27,084 81	8,313 32	8,803 31
.....	100.0	96.9	97.7	83.6	67.7	63.4	95.4	86.5

“b” Operating loss shown in italics.

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality Population	Ayr 800		Waterdown 785		Thamesville 769	
	1915	1916	1915	1916	1915	1916
—						
ASSETS	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Lands and Buildings	125 00	125 00	.....	.....	.....	.....
Sub-Station Equipment .....	.....	.....	.....	.....	.....	.....
Dist System, Overhead.....	2,934 89	2,985 40	7,024 71	7,083 27	3,418 12	3,600 40
“ “ Underground.....	.....	.....	.....	.....	.....	.....
Line Transformers.....	694 05	983 09	1,663 58	1,751 00	879 01	977 26
Meters.....	814 67	979 60	1,319 36	1,624 23	800 96	1,318 49
Street Light Equip., Regular	360 27	360 27	156 65	156 65	305 70	318 10
“ “ Ornamental .....	.....	.....	.....	.....	.....	.....
Miscel. Equip. and Con. Exp.	785 49	785 49	100 34	100 34	392 35	561 75
Steam or Hydraulic Plant...	.....	.....	.....	.....	.....	.....
Old Plant.....	3,959 68	6,635 73	.....	.....	4,893 30	4,703 40
Total Plant.....	9,674 05	12 854 58	10,264 64	10,715 49	10,689 44	11 479 40
Bank and Cash Balance.....	.....	.....	1,273 49	1,767 75	.....	689 33
Inventories.....	115 24	58 84	4 44	.....	.....	240 00
Accounts Receivable.....	91 50	91 00	.....	.....	917 65	988 96
Sinking Fund.....	.....	.....	.....	.....	.....	.....
Other Assets.....	.....	.....	.....	.....	.....	.....
Total Assets.....	9,880 79	13,004 42	11,542 57	12,483 24	11,607 09	13 397 69
LIABILITIES AND RESERVES						
Liabilities						
Debenture Balance.....	9,346 58	11,067 91	7,430 16	7,038 74	4,937 80	10,930 33
Accounts Payable.....	133 70	.....	.....	.....	1,463 42	1,081 64
Bank Overdraft.....	27 81	55 70	.....	.....	4,985 59	.....
Other Liabilities.....	.....	.....	.....	.....	.....	.....
Total Liabilities.....	9,508 09	11,123 61	7,430 16	7,038 24	11,386 81	12,011 97
Reserves						
Debentures Paid.....	.....	993.67	569 84	961 26	.....	257 47
Sinking Fund Reserve.....	.....	.....	.....	.....	.....	.....
Depreciation Reserve.....	250 00	510 00	1,785 00	2,672 00	.....	190 00
Surplus.....	122 70	377 14	1,757 57	1,811 24	220 28	938 25
Total Liabilities and Reserves....	9,880 79	13,004 42	11,542 57	12,483 24	11,607 09	13,397 69
Percentage of Net Debt to Total Assets	96.2	85.6	64.4	56.4	96.0	89.5

‘A’—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Bolton		Dundalk	Bothwell		Lucan		Woodbridge	
727		721	707		662		639	
1915	1916	1916	1915	1916	1915	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
.....
6,442 50	7,220 79	5,008 22	3,153 38	3,069 94	5,327 10	5,749 94	5,278 03	5,924 17
.....
998 38	2,039 11	551 73	432 00	499 55	811 56	1,442 57	1,667 57	1,945 29
875 60	967 72	479 20	879 40	969 30	1,191 31	1,431 76	787 58	1,008 59
561 14	561 14	510 82	316 75	326 10	372 54	372 54	314 81	319 61
.....
681 75	811 17	228 69	297 15	392 94	369 01	373 49	471 26	515 86
.....
2,236 60	1,582 85	937 90	534 19	172 82	3,204 10	2,860 45	.....	.....
.....
11,795 97	13,182 77	7,716 56	5,612 87	5,430 65	11,275 62	12,230 75	8,519 25	9,713 52
.....
167 06	76 71	288 61	266 82	247 86	414 07	47 62	752 97	744 66
248 90	364 76	36 76	.....	.....	799 05	731 09	15 93	.....
73 75	148 75	.....	155 00	585 75	.....	.....	118 91	91 41
.....
.....	.....	.....	.....	.....	b 21 08	.....	.....	.....
.....
12,285 68	13,772 99	8,041 93	6,034 69	6,264 26	12,509 82	13,009 46	9,407 06	10,549 59
.....
.....
9,357 01	9,206 88	5,879 12	534 19	5,345 15	11,213 62	10,766 47	8,499 97	8,382 63
2,694 24	2,730 35	827 21	508 79	.....	1,296 20	1,205 09	.....	369 88
.....	.....	.....	4,832 16	.....	.....	.....	.....	.....
.....
.....
12,051 25	11,937 23	6,706 33	5,875 14	5,345 15	12,509 82	11,971 56	8,499 97	8,752 51
.....
142 99	293 12	457 78	.....	189 04	.....	447 15	.....	117 34
.....
.....	321.00	200 00	.....	135 00	.....	270 00	425 00	725 00
91 44	1,221.64	677 82	159 55	595 07	.....	320 75	482 09	954 74
.....
12,285 68	13,772 99	8,041 93	6,034 69	6,264 26	12,509 82	13,009 46	9,407 06	10,549 59
.....
98.0	86.7	83.4	97.0	85.3	100.0	92.1	89.0	82.9

“ b ” Operating loss shown in italics.

STATEMENT

Comparative Condensed Balance Sheets of Electric Departments

Municipality	Ailsa Craig 586	Creemore 585		Coldwater 579		Wyoming 544
Population						
—	1916	1915	1916	1915	1916	1916
ASSETS	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Lands and Buildings				275 00	275 00	.....
Sub-Station Equipment .....						.....
Dist System, Overhead.....	4,406 27	4,150 11	4,181 44	5,278 18	5,295 16	5,105 92
“ “ Underground.....						.....
Line Transformers	657 46	681 39	681 39	1,010 77	1,010 77	471 17
Meters	547 49	738 56	844 47	1,114 04	1,193 44	607 77
Street Light Equip., Regular	362 97	272 07	272 07	354 20	354 20	342 72
“ “ Ornamental .....						.....
Miscel. Equip. and Con. Exp.	229 97	185 41	185 41	132 53	132 53	544 50
Steam or Hydraulic Plant.....						.....
Old Plant		2,651 15	2,651 15			.....
Total Plant	6,204 16	8,678 69	8,815 93	8,164 72	8,261 10	7,072 08
Bank and Cash Balance ...	534 57	326 56	739 69	117 78	1,177 47	305 89
Inventories	162 44	214 94	210 22	724 86	538 71	.....
Accounts Receivable		73 31	74 65	354 25		128 00
Sinking Fund .....						.....
Other Assets .....						.....
Total Assets	6,901 17	9,293 50	9,840 49	9,361 61	9,977 28	7,505 97
LIABILITIES AND RESERVES						
Liabilities						
Debenture Balance	6,426 65	6,323 31	6,136 01	6,801 40	6,693 83	6,313 77
Accounts Payable	140 79	2,655 76	2,637 36	90 00	90 00	915 11
Bank Overdraft .....						.....
Other Liabilities .....						.....
Total Liabilities	6,567.44	8,979 07	8,773 37	6,891 40	6,783 83	7,228 88
Reserves						
Debentures Paid		176 69	363 99	198 60	306 17	186 23
Sinking Fund Reserve .....						.....
Depreciation Reserve	180 00		200 00	1,135 00	1,460 00	.....
Surplus	153 73	137 74	503 13	1,136 61	1,427 28	90 86
Total Liabilities and Reserves	6,901 17	9,293 50	9,840 49	9,361 61	9,977 28	7,505 97
Percentage of Net Debt to Total Assets	95.2	91.5	89.2	73.6	68.9	96.4

“ A ”—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Embro 483		Flesherton 428	Woodville 388		Chatsworth 374	Baden k	
1915	1916	1916	1915	1916	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
					65 00	660 64	660 64
5,298 84	5,415 37	3,910 09	1,397 49	1,597 02	3,502 90	3,869 75	3,997 98
480 79	657 79	206 83	550 50	700 96	546 92	1,035 14	1,285 14
811 24	902 16	482 48	543 43	765 20	418 03	786 78	877 53
209 29	209 29	384 61	91 57	95 67	207 29	370 02	370 02
249 84	249 84	814 11	88 96	88 96	283 12		
426 25	426 25		2,250 00	2,250 00			
7,476 25	7,860 70	5,798 12	4,921 95	5,497 81	5,023 26	6,722 33	7,191 31
223 80	489 68	1,705 24		149 35		1,984 76	2,128 12
		433 80	648 75	315 16			
	57 96	54 23		35 65	150 00		
					175 00		
7,700 05	8,408 34	7,991 39	5,570 70	5,997 97	5,348 26	8,707 09	9,319 43
		5,417 22	3,944 36	3,885 65	4,000 00	4,672 31	4,581 66
	7,520 95	2,097 41	1,527 79	1,997 97	892 33	740 69	586 67
7,399 78			42 91		200 57		
4 95							2 79
7,404 73	7,520 95	7,514 63	5,515 06	5,883 62	5,092 90	5,413 00	5,171 12
	94 82	82 78	55 64	114 35		327 69	418 34
					175 00		
250 00	485 00	150 00				857 00	1,132 00
45 32	307 57	243 98			80 36	2,109 40	2,597 97
7,700 05	8,408 34	7,991 39	5,570 70	5,997 97	5,348 26	8,707 09	9,319 43
96.0	89.4	94.1		98.0	95.2	62.2	55.7

“ k ” Population figures not published by the Department of Agriculture.

“A”—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Comber k		Drumbo k		Delaware k		Dorchester k		Elmvale k	
1915	1916	1915	1916	1915	1916	1915	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
.....	.....	.....	.....	.....	.....	.....	.....	106 25	106 25
3,328 22	3,622 99	60 58	2,582 58	2,020 90	2,101 21	2,531 45	2,889 39	5,687 64	5,799 59
420 25	420 25	.....	316 55	216 75	216 75	694 32	694 32	755 41	755 41
487 13	631 13	18 60	614 51	316 06	316 06	641 79	659 71	1,003 45	1,050 50
199 55	199 55	.....	129 89	89 76	106 93	183 13	212 34	317 98	317 98
929 11	929 11	.....	201 16	227 81	227 81	267 41	326 54	455 93	455 93
.....	.....	3,675 29	.....	.....	.....	.....	.....	.....	.....
5,364 26	5,803 03	3,754 47	3,844 69	2,871 28	2,968 76	4,318 00	4,782 30	8,326 66	8,485 66
24 73	114 66	819 43	926 68	1,235 11	262 71	443 20	206 94	.....	154 40
.....	.....	6 35	63 41	.....	.....	.....	.....	251 86	548 55
.....	.....	.....	.....	.....	985 64	.....	430 10	95 11	140 11
.....
5,388 99	5,917 69	4,580 25	4,834 78	4,106 39	4,217 11	4,761 30	5,419 34	8,673 63	9,328 72
4,363 91	4,221 02	4,432 27	4,361 15	4,000 00	3,939 79	4,300 00	4,235 28	6,667 85	6,545 88
831 71	1,217 33	.....	42 77	.....	42 29	.....	.....	169 22	150 00
48 47	.....	.....	.....	24 00	24 00	.....	.....	192 46	.....
5,244 09	5,438 35	4,432 27	4,403 92	4,024 00	4,006 08	4,300 00	4,235 28	7,029 53	6,695 88
136 09	278 98	67 73	138 89	.....	60 21	.....	64 72	332 15	454 12
.....	145 00	.....	110 00	.....	80 00	200 00	350 00	735 00	1,025 00
8 81	55 30	80 25	182 01	82 39	70 82	261 30	769 34	576 95	1,153 72
5,388 99	5,917 69	4,580 25	4,834 78	4,106 39	4,217 11	4,761 30	5,419 34	8,673 63	9,328 72
97.6	91.9	96.8	91.1	98.0	95.0	89.5	78.1	81.0	71.8

“ A ”—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

Lynden		Mount Brydges		Plattsville		Otterville	Princeton	
k		k		k		k	k	
1915	1916	1915	1916	1915	1916	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
100 00	241 18							
2,297 50	2,489 73	2,646 79	2,650 77	2,478 44	2,482 86	2,546 60	1,671 68	1,910 44
336 18	942 37	609 50	673 25	662 94	1,270 58	479 75	297 70	680 74
344 06	424 91	668 71	691 83	862 36	891 11	473 40	342 96	479 00
137 90	137 90	120 09	120 09	133 65	133 65	193 37	116 30	116 30
144 37	200 32	143 82	143 82	504 42	504 42	142 00	27 85	32 85
3,360 01	4,436 41	4,188 91	4,279 76	4,641 81	5,282 62	3,835 12	2,456 49	3,219 33
1,934 64	213 24	1 19	743 06	367 22	221 66	163 69	1,163 08	908 69
67 50	304 57	20 05	20 00	12 96	11 24	59 50		
		171 09	52 88	372 60	713 27	516 30		5 72
		b 129 13						b 18 33
5,362 15	4,954 22	4,510 37	5,095 70	5,394 59	6,228 79	4,574 61	3,619 57	4,152 07
4,495 00	4,432 95	4,161 73	4,100 27	5,158 18	5,075 41	4,377 67	3,496 57	3,440 46
766 66	220 00	290 37	672 69	19 14	217 19	60 00		506 07
5,261 66	4,652 95	4,452 10	4,772 96	5,177 32	5,292 60	4,437 67	3,496 57	3,946 53
62 05		58 27	119 73	78 82	161 59	122 33	53 43	109 54
120 00			125 00		145 00			96 00
100 49	119 22		78 01	138 45	629 60	14 61	69 57	
5,362 15	4,954 22	4,510 37	5,095 70	5,394 59	6,228 79	4,574 61	3,619 57	4,152 07
98.1	93.9	98.5	93.7	96.1	85.0	97.0	96.5	

“ b ” Operating loss shown in italics.

“A”—Continued

of Hydro Municipalities as at December 31st, 1915 and 1916

St. George k		Stamford Tp.	Thorndale k		Thamesford k		Toronto Township	
1915	1916	1916	1915	1916	1915	1916	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
2,759 81	2,838 77	.....	1,863 71	1,893 29	2,955 44	3,490 27	1,555 50	7,204 65
851 31	851 31	.....	381 71	381 71	937 05	953 88	214 91	5,309 85
739 43	868 73	.....	466 53	534 23	918 91	1,017 56	355 15	2,908 68
218 11	218 11	.....	59 40	59 40	176 85	176 85	.....	.....
374 18	374 18	.....	273 95	273 95	260 05	158 25	.....	258 16
.....	.....	29,671 12	.....	.....	.....	.....	.....	.....
4,942 84	5,151 10	29,671 12	3,045 30	3,142 58	5,248 30	5,796 81	2,125 66	15,681 34
593 44	1,959 09	.....	61 50	77 73	246 10	186 96	1,910 90	2,828 86
87 69	22 61	.....	13 76	45 39	.....	20 00	.....	.....
814 32	.....	1,070 48	294 00	131 00	.....	113 01	914 56	914 56
.....
6,438 29	7,132 80	30,741 60	3,414 56	3,396 70	5,494 40	6,116 78	4,951 02	19,424 76
.....
5,917 17	5,829 78	.....	2,500 00	2,462 37	2,975 73	2,923 08	.....	11,673 78
229 55	330 33	29,381 21	222 30	688 68	1,281 81	1,686 75	1,314 54	1,349 56
.....	.....	.....	.....	.....	7 62	.....	.....	.....
6,146 72	6,160 11	29,381 21	2,722 30	3,151 05	4,265 16	4,609 83	1,314 54	13,023 34
82 83	170 22	.....	.....	37 63	82 27	134 92	.....	326 22
.....	150 00	.....	265 00	100 66	500 00	735 00	1,800 00	3,734 00
208 74	652 47	1,360 39	427 26	107 36	646 97	637 03	1,836 48	2,341 20
6,438 29	7,132 80	30,741 60	3,414 56	3,396 70	5,494 40	6,116 78	4,951 02	19,424 76
95.6	86.3	.....	79.8	92.8	77.6	75.3	26.6	67.1

“k” Population, under 500.

Municipality	Williamsburg		Waubaushene	
Population	k		k	
—	1915	1916	1915	1916
ASSETS	\$ c.	\$ c.	\$ c.	\$ c.
Lands and Buildings				
Sub-Station Equipment				
Distribution System, Overhead	1,478 83	1,478 83	2,637 80	2,755 95
" " Underground				
Line Transformers	297 89	297 89	239 66	239 66
Meters	427 57	427 57	532 86	664 13
Street Light Equipment, Regular	66 16	66 16	142 22	142 22
" " Ornamental				
Miscel. Equip. and Construction Exp.	4 00	4 00	257 66	257 66
Steam or Hydraulic Plant				
Oid Plant				
Total Plant	2,274 45	2,274 45	3,810 20	4,059 62
Bank and Cash Balance	636 27	827 76	365 41	3 00
Inventories	168 91	121 70	62 23	3 28
Accounts Receivable			99 64	387 90
Sinking Fund				
Other Assets				
Total Assets	3,079 63	3,223 91	4,337 48	4,453 80
LIABILITIES AND RESERVES				
Liabilities				
Debenture Balance	2,666 83	2,579 50		3,891 26
Accounts Payable	52 39	41 75	4,164 57	49 00
Bank overdraft	220 67			
Other Liabilities				
Total Liabilities	2,939 89	2,621 25	4,164 57	3,940 26
Reserves				
Debentures Paid	83 17	170 50		108 74
Sinking Fund Reserve				
Depreciation Reserve		70 00		115 00
Surplus	56 57	362 16	172 91	289 80
Total Liabilities and Reserves ...	3,079 63	3,223 91	4,337 48	4,453 80
Percentage of Net Debt to Total Assets	95.5	81.3	96.0	86.5

CONDENSED
REVENUE AND EXPENSE
OR
OPERATING REPORT
FOR
1916

STATE

Report Showing Operation of Municipalities

Municipality	Months Covered by Report	Population	Plant Cost	Debt and Overdraft	Operation and Maintenance	Fixed Charges	Total Operation
			\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Toronto.....	12	463,705	7,501,186 77	6,097,731 80	1,063,778 95	400,434 57	1,464,213 52
Hamilton....	12	100,461	1,084,192 15	825,104 45	197,843 10	61,266 73	259,109 83
Ottawa.....	12	100,163	913,252 04	498,125 63	141,041 02	42,371 44	183,412 46
London.....	12	58,055	825,359 68	499,771 80	230,230 75	40,099 60	270,330 35
Brantford....	12	25,420	274,678 49	218,469 56	46,734 70	17,221 00	63,955 70
Windsor.....	12	24,162	438,380 97	416,545 31	76,682 19	17,258 16	93,940 35
Peterborough.	12	20,426	228,661 07	189,870 42	79,050 39	11,981 33	91,031 72
Kitchener....	12	19,266	365,755 80	207,182 62	80,063 85	18,474 43	98,538 28
St. Catharines	12	17,880	232,718 53	194,213 57	45,479 47	12,411 67	57,891 14
St. Thomas..	12	17,174	211,286 07	85,080 79	64,559 75	8,314 07	72,873 82
Stratford....	12	17,081	226,136 69	146,416 10	48,533 08	14,794 02	63,327 10
Guelph.....	12	16,735	239,506 30	75,010 81	62,184 49	10,273 28	72,457 77
Port Arthur..	12	14,307	675,641 74	388,735 82	80,232 38	47,428 64	127,661 02
Chatham.....	12	12,863	163,232 27	161,006 98	25,457 35	8,855 45	34,312 80
Owen Sound..	12	11,910	153,967 25	63,165 87	41,889 31	11,281 56	53,170 87
Galt.....	12	11,852	277,118 00	189,098 94	55,209 42	15,303 85	70,513 27
Sarnia.....	6	11,676	223,571 71	209,383 87	14,954 32	7,738 92	22,693 24
Niagara Falls	12	11,147	182,052 18	102,549 60	34,161 50	9,078 40	43,239 90
Woodstock...	12	10,084	154,439 06	41,767 41	36,312 92	7,241 71	43,554 63
Brockville...	12	9,428	154,946 87	105,534 62	34,907 77	15,535 74	50,443 51
Welland.....	12	7,243	101,388 09	77,398 44	72,489 20	8,199 77	80,688 97
Barrie.....	12	6,453	108,970 43	26,395 66	20,687 73	6,052 29	26,740 02
Collingwood..	12	6,361	64,088 83	17,585 96	28,701 65	3,393 33	32,094 98
Midland.....	12	6,258	84,568 48	23,868 27	16,812 34	3,955 47	20,767 81
Ingersoll....	12	5,176	102,608 86	64,501 35	25,594 07	4,905 00	30,499 07
Walkerville..	12	5,096	183,321 12	159,865 92	91,766 04	11,092 60	102,858 64
Waterloo....	12	4,956	101,980 86	55,501 37	25,664 44	3,475 25	29,139 69
Goderich.....	12	4,655	85,346 21	45,122 64	13,593 88	5,302 27	18,896 15
Dundas.....	12	4,652	80,108 49	59,719 89	13,103 58	5,565 39	18,668 97
Preston.....	12	4,643	111,640 19	73,898 91	26,900 28	7,258 79	34,159 07
Paris.....	12	4,370	84,232 04	50,314 61	11,881 72	6,665 00	18,546 72
Wallaceburg..	12	4,107	62,517 34	60,039 21	13,811 43	3,701 50	17,512 93
Simcoe.....	12	4,061	35,735 36	33,702 58	4,819 71	1,948 91	6,768 62
Brampton....	12	4,041	84,151 79	55,467 47	18,526 63	4,739 19	23,265 82
St. Marys....	12	3,958	82,069 48	38,344 12	14,585 97	4,775 42	19,361 39
Penetang....	12	3,928	45,290 12	24,555 92	14,859 07	2,050 40	16,909 47
Petrolia....	7	3,891	42,552 34	41,998 31	4,508 25	1,486 24	5,994 49
Tillsonburg...	12	3,084	39,034 81	22,008 49	11,762 50	2,594 83	14,357 33
Strathroy....	12	2,998	45,023 00	37,109 15	9,669 31	2,188 26	11,857 57
Hespeler....	12	2,740	32,746 48	21,665 34	13,039 33	3,144 34	16,183 67
Prescott.....	12	2,740	54,710 75	20,359 26	10,492 35	1,983 39	12,475 74
Orangeville..	5	2,493	28,123 02	27,878 34	2,233 77	610 88	2,844 65
Listowel....	12	2,326	31,249 78	24,390 16	7,126 50	2,928 48	10,054 98
Ridgetown...	12	2,326	23,702 41	16,909 36	5,303 48	1,840 86	7,144 34
Elmira.....	12	2,270	19,810 93	12,860 36	4,765 69	1,377 58	6,143 27
Clinton.....	12	2,177	39,421 58	34,843 80	5,918 41	3,089 21	9,007 62
Weston.....	12	2,156	36,918 56	14,032 73	8,740 21	2,096 09	10,836 30
Milton.....	13	2,072	28,640 86	10,336 99	11,420 84	2,178 67	13,599 51
Mimico.....	12	1,976	29,528 43	20,093 18	6,267 82	2,580 10	8,847 92
Chesley.....	4	1,975	26,572 60	25,333 61	1,512 63	482 05	1,994 68
Seaforth.....	12	1,964	31,464 20	18,311 33	13,584 03	1,695 75	15,279 7 8
Mount Forest	12	1,941	29,055 35	22,369 13	4,904 35	1,622 33	6,526 68
Georgetown..	12	1,905	30,943 56	16,887 27	11,442 26	1,963 05	13,405 31
Palmerston..	12	1,843	22,950 76	12,443 76	3,768 68	1,840 00	5,608 68
Fergus.....	12	1,776	17,767 32	13,052 21	4,320 60	1,148 74	5,469 34

MENT "B"

for Period ending December 31st, 1916

Revenue	Surplus	Depreciation	Surplus less Depreciation	Number of Consumers				PerCent. of Con- sumers to Popu- lation	H. P. taken in Dec. 1916
				Dom- estic	Com'l	Power	Total		
\$ c.	\$ c.	\$ c.	\$ c.						
1,690,998 42	226,784 90	208,388 09	18,396 81	34,347	7,406	1,707	43,460	+ 9.4	47,165
343,330 63	84,220 80	32,110 54	52,110 26	12,423	1,546	464	14,433	+ 14.4	10,482
219,480 40	36,067 94	32,775 00	3,292 94	7,912	1,107	188	9,207	+ 9.2	5,484
340,791 79	70,461 44	29,060 62	41,400 82	8,282	1,129	295	9,706	+ 16.7	9,256
80,042 51	16,086 81	7,500 00	8,586 81	2,056	334	26	2,416	+ 9.5	2,393
99,802 51	5,862 16	5,157 50	704 66	3,180	439	66	3,685	+ 14.9	1,696
107,279 07	16,247 35	6,250 00	9,997 35	3,401	602	117	4,120	20.2	3,794
121,686 57	23,148 29	14,638 25	8,510 04	2,407	543	147	3,097	16.1	3,702
78,814 24	20,923 10	10,500 00	10,423 10	2,410	247	48	2,705	+ 15.1	3,020
98,159 08	25,285 26	9,800 00	15,485 26	2,241	464	107	2,812	16.4	2,121
74,931 86	11,604 76	7,500 00	4,104 76	1,993	463	103	2,559	14.9	1,655
91,531 67	19,073 90	10,700 00	8,373 90	2,033	490	86	2,609	15.6	3,003
170,982 98	43,321 96	.....	43,321 96	2,701	481	46	3,228	22.6	2,355
34,914 46	601 66	.....	601 66	1,171	215	25	1,411	+ 11.0	660
61,201 13	8,030 26	3,307 80	4,722 46	1,376	435	83	1,894	15.9	812
79,088 61	8,575 34	8,500 00	75 34	2,236	386	79	2,701	22.8	2,673
33,618 93	10,925 69	.....	10,925 69	1,888	418	54	2,360	20.2	.....
57,465 87	14,225 97	8,315 00	5,910 97	2,050	400	80	2,530	22.7	2,543
56,627 61	13,072 98	6,930 20	6,142 78	1,224	372	72	1,668	16.5	1,185
59,719 76	9,276 25	7,000 00	2,276 25	965	312	31	1,308	13.9	303
93,646 11	12,957 14	4,000 00	8,957 14	536	75	24	635	+ 8.8	5,963
35,021 86	8,281 84	2,575 00	5,706 84	896	257	18	1,171	16.6	591
41,627 62	9,532 64	2,150 00	7,382 64	714	242	33	989	15.5	1,064
27,477 04	6,709 23	3,100 00	3,609 23	732	184	31	947	15.1	824
38,189 63	7,690 56	2,650 00	5,040 56	590	206	51	847	16.4	882
112,465 90	9,607 26	3,773 06	5,834 20	1,513	216	75	1,804	*	1,765
34,743 81	5,604 12	3,700 00	1,904 12	592	150	50	792	16.0	874
23,135 42	4,239 27	2,600 00	1,639 27	511	159	9	679	14.6	221
26,103 55	7,434 58	2,830 00	4,604 58	673	168	35	876	+ 18.8	612
37,790 20	3,631 13	3,500 00	131 13	785	182	34	1,001	21.6	1,249
23,234 18	4,687 46	2,000 00	2,687 46	552	150	4	706	16.2	413
18,645 63	1,132 70	1,038 00	94 70	434	154	5	593	14.4	312
8,165 21	1,396 59	1,350 00	46 59	57	84	12	153	3.8	113
28,128 11	4,862 29	3,000 00	1,862 29	722	175	24	921	22.8	815
22,838 66	3,477 27	2,900 00	577 27	563	161	28	752	18.8	489
18,783 84	1,874 37	1,780 00	94 37	189	95	16	300	7.7	460
6,065 32	70 83	.....	70 83	257	155	14	426	10.9	224
17,227 88	2,870 55	1,600 00	1,270 55	375	158	17	550	17.8	249
15,086 66	3,229 09	1,050 00	2,179 09	314	152	8	474	15.8	231
18,033 52	1,849 85	1,075 00	774 85	277	84	12	383	14.0	651
14,558 20	2,082 46	1,880 00	202 46	380	133	12	525	19.2	243
3,089 33	244 68	.....	244 68	120	77	4	201	8.1	185
10,464 38	409 40	.....	409 40	225	117	7	349	15.0	177
8,999 72	1,855 38	425 00	1,430 38	174	101	3	278	12.0	88
8,270 31	2,127 04	620 00	1,507 04	233	93	12	338	14.9	125
10,647 91	1,640 29	1,200 00	440 29	211	112	7	330	15.2	138
15,797 35	4,961 05	1,600 00	3,361 05	475	88	11	574	26.6	267
16,815 90	3,216 39	900 00	2,316 39	197	84	6	287	13.9	361
11,515 64	2,667 72	1,000 00	1,667 72	621	31	8	660	*	186
2,588 38	593 70	.....	593 70	157	70	4	231	11.7	100
17,629 14	2,349 36	1,225 00	1,124 36	280	110	12	402	20.5	472
8,613 58	2,086 90	615 00	1,471 90	164	106	2	272	.....	111
18,095 44	4,690 13	1,210 00	3,480 13	306	99	21	426	22.3	295
7,927 15	2,318 47	295 00	2,023 47	151	63	1	215	11.7	91
8,217 95	2,748 61	500 00	2,248 61	149	92	7	248	14.0	114

STATEMENT

Report Showing Operation of Municipalities

Municipality	Months Covered by Report	Population	Plant Cost	Debt and Overdraft	Operation and Maintenance	Fixed Charges	Total Operation
			\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Tilbury.....	12	1,740	14,171 78	13,185 17	3,356 62	864 00	4,220 62
Acton.....	12	1,735	16,981 17	6,273 04	3,675 50	1,101 41	4,776 91
Gravenhurst..	12	1,702	54,955 63	32,665 11	5,930 06	3,483 41	9,413 47
Mitchell.....	12	1,687	28,455 43	8,025 13	7,210 74	1,808 33	9,019 07
Durham.....	12	1,600	18,079 97	17,829 99	2,470 18	1,277 28	3,747 46
Exeter.....	6	1,572	17,636 81	16,680 97	2,089 74	665 47	2,755 21
New Hamburg	12	1,543	24,894 73	10,723 41	4,573 25	1,170 92	5,744 17
Dresden.....	12	1,521	17,583 12	16,349 58	4,110 62	1,492 65	5,603 27
Vict. Harbor..	12	1,477	7,252 78	6,104 85	1,218 11	497 96	1,716 07
Blenheim....	13	1,424	16,736 93	14,572 84	4,271 82	897 08	5,168 90
Harriston....	12	1,404	14,029 79	13,242 00	3,278 64	992 61	4,271 25
Pt. Dalhousie.	12	1,318	17,535 74	15,774 09	3,659 39	1,264 89	4,924 28
Caledonia....	12	1,217	7,309 75	4,121 25	1,114 15	361 72	1,475 87
Norwich.....	12	1,189	18,473 99	9,897 65	7,703 17	2,452 31	10,155 48
New Toronto..	12	1,186	17,962 53	11,899 06	7,536 87	922 31	8,459 18
Waterford...	12	1,133	9,947 19	7,751 30	2,549 61	1,366 37	3,915 98
Shelburne...	5	1,115	17,297 71	16,290 76	888 83	34 33	923 16
Elora.....	12	1,115	13,668 03	11,154 74	2,961 90	875 17	3,837 07
Hagersville...	12	1,105	10,440 64	4,693 98	3,976 97	550 80	4,527 77
Winchester...	12	1,065	11,391 52	7,659 28	3,243 31	773 70	4,017 01
Pt. Credit...	12	1,046	12,603 53	7,276 90	2,190 80	568 95	2,759 75
Beaverton...	12	1,015	13,842 13	13,367 64	2,996 11	855 20	3,851 31
Markdale.....	9	989	11,136 88	9,820 02	1,451 13	657 86	2,108 99
Stayner.....	12	972	15,284 16	12,610 00	3,238 41	753 16	3,991 57
Cannington...	12	903	13,552 32	13,211 90	3,089 79	898 52	3,988 31
Milverton....	7	893	7,695 81	7,389 59	640 35	690 86	1,331 21
Dutton.....	12	870	8,201 05	6,561 62	2,110 32	476 04	2,586 36
Pt. Stanley...	12	849	21,533 77	11,577 75	5,981 83	1,232 82	7,214 65
Chesterville..	12	854	7,902 78	6,718 30	2,498 91	435 34	2,934 25
Ayr.....	12	800	12,854 58	10,973 77	1,782 59	1,076 82	2,859 41
Waterdown...	12	785	10,715 49	5,270 99	2,791 53	1,482 95	4,274 48
Thamesville..	12	769	11,479 40	10,093 68	2,157 76	740 65	2,898 41
Bolton.....	12	727	13,182 77	11,347 01	4,518 83	866 16	5,384 99
Dundalk.....	12	721	7,716 56	6,380 96	1,551 02	818 56	2,369 58
Bothwell....	12	703	5,430 65	4,511 54	1,746 30	565 99	2,312 29
Lucan.....	12	662	12,230 75	10,992 85	1,879 34	873 49	2,752 83
Woodbridge...	12	639	9,713 52	7,916 44	2,838 72	636 88	3,475 60
Ailsa Craig..	12	586	6,204 16	5,870 43	893 39	401 10	1,294 49
Creemore....	12	585	8,815 93	7,748 81	2,714 05	689 52	3,403 57
Coldwater...	12	579	8,261 10	5,067 65	1,505 04	481 64	1,986 68
Wyoming....	2	544	7,072 08	6,794 99	116 32	103 04	219 36
Embro.....	12	483	7,860 70	6,973 31	1,243 70	390 30	1,634 00
Flesherton...	12	428	5,798 12	5,321 36	1,017 27	85 34	1,102 61
Wodville....	12	388	5,497 81	5,383 46	2,287 11	330 46	2,617 57
Chatsworth...	11	374	5,023 26	4,767 90	884 13	310 81	1,194 94
Baden.....	12	.....	7,191 31	3,043 00	5,462 16	325 28	5,787 44
Brechin.....	12	.....	2,298 00	2,261 66	1,826 35	171 09	1,997 44
Beachville...	12	.....	9,859 19	4,565 33	5,808 74	369 82	6,178 56
Burford.....	12	.....	6,342 70	5,742 10	1,299 36	413 25	1,712 61
Comber.....	12	.....	5,803 03	5,323 69	1,426 85	378 26	1,805 11
Drumbo.....	12	.....	3,844 69	3,413 83	671 88	271 11	942 99
Delaware....	12	.....	2,968 76	2,757 73	439 96	229 35	669 31
Dorchester...	12	.....	4,782 30	3,598 24	943 93	281 55	1,225 48
Elmvale.....	12	.....	8,485 66	5,852 82	1,855 84	498 83	2,354 67
Granton.....	5	.....	3,597 97	3,447 72	277 24	108 53	385 77

“B”—Continued

for Period ending December 31st, 1916

Revenue	Surplus	Depreciation	Surplus less Depreciation	Number of Consumers				PerCent. of Con- sumers to Popu- lation	H. P. taken in Dec. 1916
				Dom- estic	Com'l	Power	Total		
\$ c.	\$ c.	\$ c.	\$ c.						
4,680 32	459 70	275 00	184 70	127	79	2	208	12.0	60
6,734 07	1,957 16	500 00	1,457 16	185	60	7	252	14.5	82
11,769 84	2,356 37	1,650 00	706 37	285	63	10	358	21.0	241
10,330 45	1,311 38	1,000 00	311 38	218	103	21	342	20.3	145
3,644 05	103 41	.....	103 41	155	67	.....	222	13.9	60
3,292 00	536 79	.....	536 79	140	81	2	223	14.3	91
6,902 49	1,158 32	830 00	328 32	196	70	4	270	17.5	91
5,918 01	314 74	.....	314 74	197	106	.....	303	19.9	66
2,533 66	817 59	190 00	627 59	65	31	.....	96	6.5	29
7,155 91	1,987 01	440 00	1,547 01	208	85	.....	293	20.6	75
4,587 90	316 65	345 00	28 35	113	58	1	172	12.3	48
4,840 16	84 12	.....	84 12	330	32	8	370	*	71
2,320 59	844 72	260 00	484 72	27	37	3	67	5.5	43
11,044 67	889 19	1,370 00	480 81	297	87	6	390	*	190
12,296 66	3,837 48	450 00	3,387 48	210	12	4	226	19.1	429
4,091 34	175 36	.....	175 36	99	42	2	143	12.6	114
1,478 90	555 74	.....	555 74	112	72	.....	184	16.5	49
5,061 26	1,224 19	375 00	849 19	105	63	2	170	15.2	95
6,678 54	2,150 77	380 00	1,770 77	127	69	4	200	18.1	96
4,943 64	926 63	370 00	556 63	135	46	1	182	17.1	67
3,535 91	776 16	470 00	306 16	145	32	3	180	17.2	60
3,851 31	.....	.....	.....	131	60	6	197	19.4	54
2,735 94	626 95	.....	626 95	106	68	3	177	18.0	56
4,453 83	462 26	280 00	182 26	115	65	3	183	18.8	56
3,988 31	.....	.....	.....	137	57	7	201	22.3	58
1,364 93	33 12	.....	33 12	56	50	.....	106	11.9	40
4,029 89	1,443 53	240 00	1,203 53	112	52	1	165	19.0	44
8,422 26	1,207 61	665 00	542 61	308	72	11	391	*	59
3,707 10	772 85	375 00	397 85	89	47	1	137	16.0	61
3,373 85	514 44	260 00	254 44	83	48	2	133	16.6	39
5,215 15	940 67	887 00	53 67	93	32	6	131	*	48
3,806 38	907 97	190 00	717 97	137	59	.....	196	25.5	40
6,836 19	1,451 20	321 00	1,130 20	70	36	4	110	15.1	99
3,247 40	877 82	200 00	677 82	88	63	2	153	21.2	70
2,882 81	570 52	135 00	435 52	78	52	.....	130	18.5	28
3,256 56	503 73	270 00	233 73	98	42	7	147	22.2	50
4,248 25	772 65	300 00	472 65	58	33	7	98	15.3	78
1,628 22	333 73	180 00	153 73	51	11	1	63	10.8	18
3,996 85	593 28	200 00	393 28	78	44	2	124	21.2	41
2,602 35	615 67	325 00	290 67	70	39	2	111	19.2	37
310 22	90 86	.....	90 86	45	28	.....	73	13.4	27
2,131 25	497 25	235 00	262 25	58	29	2	89	.....	27
1,496 59	393 98	150 00	243 98	73	30	.....	103	.....	33
2,617 57	.....	.....	.....	41	24	3	68	.....	46
1,275 30	80 36	.....	80 36	36	23	1	60	.....	30
6,551 01	763 57	275 00	488 57	84	.....	5	89	.....	220
1,997 44	.....	.....	.....	16	20	1	37	.....	33
6,207 45	28 89	375 00	346 11	42	12	3	57	.....	188
2,049 85	337 24	165 00	172 24	64	30	1	95	.....	27
1,996 66	191 55	145 00	46 55	37	37	.....	74	.....	21
1,154 75	211 76	110 00	101 76	35	22	.....	57	.....	15
737 74	68 43	80 00	11 57	23	12	.....	35	.....	8
1,883 52	658 04	150 00	508 04	61	16	2	79	.....	11
3,221 44	866 77	290 00	576 77	81	62	3	146	.....	70
491 75	105 98	.....	105 98	41	16	.....	57	.....	1

STATEMENT

Report Showing Operation of Municipalities

Municipality	Months Covered by Report	Population	Plant Cost	Debenture Debt and Overdraft	Operation and Maintenance	Fixed Charges	Total Operation
			\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Grantham Tp.	12	.....	3,900 47	5,202 84	1,614 28	2,997 93	4,612 21
Holstein	8	.....	2,452 96	2,424 65	263 99	229 17	493 16
Lambeth	12	.....	4,241 08	3,868 09	951 60	382 49	1,334 09
Lynden	12	.....	4,436 41	4,135 14	1,038 66	315 32	1,353 98
Mt. Brydges .	12	.....	4,279 76	3,957 02	1,479 45	296 20	1,775 65
Otterville ...	10	.....	3,835 12	3,641 53	517 84	346 74	864 58
Plattsville...	12	.....	5,282 62	4,346 43	2,235 22	346 17	2,581 39
Princeton....	12	.....	3,219 33	3,032 12	1,077 47	239 57	1,317 04
Pt. McNicoll .	12	.....	4,982 48	5,001 41	972 85	482 51	1,455 36
Rockwood....	12	.....	6,986 46	2,940 86	1,065 53	395 77	1,461 30
Sunderland ..	12	.....	6,715 13	6,461 35	1,677 81	399 07	2,076 88
St. George ...	12	.....	5,151 10	4,178 41	1,358 57	412 83	1,771 40
Stamford Tp.	12	.....	29,671 12	28,310 73	2,964 95	737 19	3,702 14
Thorndale ...	12	.....	3,142 58	2,896 93	1,383 40	205 60	1,589 00
Thamesford..	12	.....	5,796 81	4,289 86	1,221 72	477 08	1,698 80
Toronto Twp.	12	.....	15,681 34	9,279 92	3,031 97	3,253 87	6,285 84
Williamsburg.	12	.....	2,274 45	1,671 79	703 09	220 67	923 76
Waubashene .	12	.....	4,059 62	3,546 08	883 12	425 56	1,308 68
Total		1,155,000	17,330,015 07	12,580,845 40	3,188,283 52	951,781 99	4,140,065 51

NOTE—Population in Villages estimated at 400

† Competitive territory.

* Rural or Summer populations create abnormal condition.

"B" —Continued

for Period ending 31st December, 1916

Revenue	Surplus	Deprecia- tion	Surplus less Depreciation	Number of Consumers			PerCent. of Con- sumers to Popu- lation	H. P. taken in Dec. 1916
				Dom- estic	Com'l Power	Total		
\$ c.	\$ c.	\$ c.	\$ c.					
3,030 72	1,581 40		1,581 40	130		130		19
435 43	57 73		57 73	26	14	40		8
1,453 97	119 88	100 00	19 88	54	13	68		18
1,492 71	138 73	120 00	18 73	24	10	35		86
2,107 79	332 14	125 00	207 14	55	15	72		25
879 19	14 61		14 61	40	24	65		15
3,217 54	636 15	145 00	491 15	60	22	85		53
1,325 14	8 10	96 00	87 00	44	11	55		10
1,264 11	101 25	130 00	324 25	66	21	88		21
2,531 28	1,069 98	240 00	829 98	72	11	87		15
2,076 88				61	37	99		52
2,335 13	613 73	150 00	463 73	56	24	82		56
5,062 53	1,360 39		1,360 39	160		175		
1,435 93	103 07	85 00	188 07	33	12	46		42
1,923 86	225 06	235 00	9 04	64	29	95		32
8,369 78	2,083 94	1,984 00	149 94	213		213		88
1,299 35	375 59	70 00	305 59	41	9	51		17
1,540 57	231 89	115 00	116 89	58	20	79		19
4,983,601 03	843,535 52	486,141 80	357,393 72	118,849	25,230	4,653,148.732		

STATE

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality	Toronto				Hamilton
Population	xa	463,705			100,461
					xa
—	1913	1914	1915	1916	1913
EARNINGS					
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	190,376 89	289,645 45	331,807 18	335,181 19	34,451 95
Commercial Light	233,799 04	305,534 31	291,907 92	272,243 06	25,453 99
Power	347,708 88	483,681 15	575,239 17	612,918 32	47,415 58
Street Light	344,933 79	364,214 17	350,085 97	361,920 32	2,250 89
Miscellaneous	29,891 21	39,651 98	40,076 70	108,735 53	9,841 52
Total	1,146,709 81	1,482,727 06	1,589,116 94	1,690,998 42	119,413 93
EXPENSES					
Power Purchased	255,986 26	323,586 97	430,830 00	529,180 54	47,307 65
Sub-Stn. Operation	32,216 66	42,667 33	42,890 24	44,866 07	3,240 97
“ “ Maint'ce. . .	11,510 69	23,560 14	17,243 40	35,187 08	94 01
Dist. System, Operation and Maintenance	50,693 34	59,013 81	59,782 15	53,175 40	3,168 21
Line Transformer M't'c'e. .	3,396 98	5,218 22	6,768 29	4,976 03	1,216 21
Meter Maintenance	1,648 28	3,072 21	3,856 44	7,085 21	16 39
Consumers' Premises—Exp. Street Light Sys., Operation and Maintenance..	36,536 64	52,893 31	37,821 37	44,278 89	2,693 70
Promotion of Business...	45,801 72	48,674 18	63,981 72	61,202 90	1,375 46
Billing and Collecting...	60,256 03	71,477 64	54,128 73	53,416 92	4,391 01
Gen. Office, Sal. and Exp.	43,581 71	50,028 39	64,825 42	72,579 07	6,270 38
Undistributed Expenses .	85,957 58	125,972 92	93,332 31	124,068 67	3,623 22
Int. and Deb. Payments .	44,304 25	54,191 98	57,693 43	33,762 17	1,289 35
Miscellaneous Expenses .	274,285 24	325,551 67	362,337 99	400,434 57	30,201 49
Total Expenses	946,175 38	1,190,244 57	1,318,821 50	1,464,213 52	104,888 05
Surplus	200,534 43	292,482 49	270,295 44	226,784 90	14,525 88
Loss					
Depreciation Charge. .	115,236 80	147,181 40	173,862 95	208,388 09	9,031 35
Surp. Less Depr. Chg.	85,297 63	145,301 09	96,432 49	18,396 81	5,494 53

“b” Patriotic Fund contributions.

xa Hydro Department operated separately.

xb Hydro and Water Departments operated jointly.

xc Hydro and Gas Departments operated jointly.

xd Hydro and Railway Departments operated jointly.

xe Hydro, Railway and Gas Departments operated jointly.

xf Hydro, Water and Gas Departments operated jointly.

xg Hydro, Water, Telephone and Railway Departments operated jointly.

xh Hydro Department handled by municipal officials.

MENT “C”

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Hamilton			Ottawa			
100,461			100,163			
1914			1913			
1915			1914			
1916			1915			
1916			1916			
\$ c.			\$ c.			
74,668 38	92,723 71	108,137 22	68,032 27	68,767 48	67,441 19	72,875 12
35,125 57	34,754 72	36,126 03	53,438 04	51,769 72	46,636 99	42,569 96
70,665 43	83,990 38	115 224 78	26,978 76	31,748 23	32,126 50	42,996 39
51,154 36	86,244 98	80,815 73	49,199 57	50,439 29	56,813 66	60,632 48
2,564 82	2,619 70	3,026 87	.....	183 11	225 48	406 45
234,178 56	300,333 49	343,330 63	197,648 64	202,910 83	203,243 82	219,480 40
78,968 72	103,922 98	121,982 71	50,750 00	55,512 39	53,018 54	60,859 15
5,741 24	7,226 49	9,107 51	3,127 63	3,321 20	3,989 78	4,341 42
653 61	1,644 78	2,012 08	107 58	300 81	588 81	132 82
6,504 84	14,090 13	6,847 26	13,694 44	17,041 58	18,193 82	17,787 91
505 26	921 70	1,067 67	245 82	1,996 40	635 82	683 36
143 97	1,172 88	886 05	1,537 17	2,390 11	3,444 25	3,241 68
2,782 23	4,061 03	3,556 22	10,572 43	6,082 30	2,534 80	.....
13,380 35	10,394 16	10,735 03	15,465 59	15,318 91	19,712 71	15,147 81
3,999 76	3,443 77	3,752 54	1,008 50	1,060 00	3,118 79	8,277 56
10,825 27	13,832 80	15,780 73	6,417 69	7,481 30	8,915 38	13,722 50
12,894 66	17,083 98	17,740 82	6,941 68	9,604 33	11,699 46	11,470 18
3,407 34	4,972 47	4,374 48	1,453 47	2,350 91	3,671 03	4,660 34
46,398 68	60,759 61	61,266 73	30,961 54	38,002 88	40,365 58	42,371 44
.....	.....	.....	.....	.....	.....	b 716 29
186,205 93	243,526 78	259,109 83	142,283 54	160,463 12	169,888 77	183,412 46
47,972 63	56,806 71	84,220 80	55,365 10	42,447 71	33,355 05	36,067 94
.....
21,053 66	25,808 87	32,110 54	24,000 00	32,650 00	33,000 00	32,775 00
26,918 97	30,997 84	52,110 26	31,365 10	9,797 71	355 05	3,292 94

“b” Patriotic Fund Contributions.
xa See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	London xb 58,055				Brantford 25,420 xd
—	1913	1914	1915	1916	1914
EARNINGS					1
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	41,172 64	57,473 08	57,184 75	71,146 90	7,103 77
Commercial Light	39,256 07	47,593 44	43,751 37	48,747 74	5,392 87
Power	79,659 78	130,936 35	148,567 23	180,204 33	647 69
Street Light	28,372 20	30,535 83	31,168 87	31,719 17	21,724 64
Miscellaneous	3,763 78	3,313 10	4,958 29	8,973 65	627 57
Total	192,224 47	269,851 80	285,630 51	340,791 79	35,496 54
EXPENSES					
Power Purchased	72,676 41	97,404 63	122,893 29	155,208 55	12,999 65
Sub-Stn. Operation	5,816 18	9,925 89	8,671 25	11,260 87	1,069 43
“ “ Maint'ce...	519 81	767 40	135 79	329 76	7 84
Dist. System, Operation and Maintenance	5,342 67	3,850 78	5,220 69	6,069 41	376 83
Line Transformer M't'ce.	1,674 88	760 87	94 82	839 69	65 26
Meter Maintenance.....	138 23	95 60	372 13	3,169 66	10 08
Consumers' Premises—Exp..	1,827 71	2,119 53	2,455 20	3,217 49	40
Street Light Sys., Operation and Maintenance..	5,278 72	8,511 05	6,303 42	7,577 61	1,460 00
Promotion of Business ..	5,833 84	5,840 01	6,902 59	7,853 28	1,608 37
Billing and Collecting ...	6,738 13	9,126 81	10,762 84	10,560 10	994 63
Gen. Office, Sal. and Exp..	14,180 20	16,845 61	15,042 13	12,777 04	1,039 66
Undistributed Expenses ..	6,297 08	6,687 31	4,943 05	6,866 73	215 98
Int. and Deb. Payments..	29,488 97	35,127 20	38,493 89	40,099 60	7,444 31
Miscellaneous Expenses ..	.....	.....	b 2,776 28	4,500 56	.....
Total Expenses	155,812 83	197,062 69	225,067 37	270,330 25	27,322 44
Surplus	36,411 64	72,789 11	60,563 14	70,461 44	8,174 10
Loss .....	.....	.....	.....	.....	.....
Depreciation Charge .	21,058 82	27,588 39	32,734 97	29,060 62	6,000 00
Surp. Less Depr. Chg.	15,352 82	45,200 72	27,828 17	41,400 82	2,174 10

“b” Patriotic Fund contributions.

“1” 9 months' operation.

xb, xd See page 68.

"C"—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

xd Brantford 25,420		xa Windsor 24,162			xe Kitchener 19,266	
1915	1916	1914	1915	1916	1913	1914
		f			p	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
13,629 36	17,504 44	3,143 41	23,161 57	35,565 59	16,558 82	17,757 08
10,746 67	10,530 19	1,107 38	12,009 99	16,831 60	20,985 35	19,549 45
12,901 29	24,213 00	9 77	3,734 81	7,370 82	38,368 34	49,173 17
28,691 05	27,500 83	3,997 85	31,947 11	37,266 17	17,373 81	16,544 11
327 94	294 05	.....	961 07	2,768 13	1,268 87	1,726 92
66,296 31	80,042 51	8,258 41	71,814 55	99,802 51	94,555 19	104,750 73
24,661 13	33,566 59	4,330 41	38,849 61	51,655 51	33,359 47	40,275 75
2,111 85	2,975 10	408 67	2,588 72	2,466 76	4,892 72	4,282 95
177 02	114 98	.....	236 47	282 77	1,175 64	294 68
684 06	814 74	240 41	629 41	816 44	1,575 15	4,411 10
160 65	267 97	.....	48 49	157 84	205 39	20 35
199 00	167 27	.....	11 70	131 68	326 51	564 97
3 53	3 19	.....	222 87	750 40	101 97	75 83
3,420 03	3,110 37	.....	1,667 97	6,647 83	2,803 88	3,884 76
1,644 50	1,313 05	.....	1,455 58	1,301 56	452 28	630 50
1,625 66	1,819 63	441 36	2,416 24	4,661 77	1,901 40	2,259 54
1,443 91	1,371 24	2,170 90	3,821 74	4,922 46	2,532 25	2,615 07
798 48	1,210 57	.....	1,502 25	2,887 17	1,966 04	1,966 38
14,686 37	17,221 00	666 66	13,038 53	17,258 16	17,897 45	18,719 43
.....	.....	.....	.....	.....	.....	b 619 00
81,616 19	63,955 70	8,258 41	66,489 68	93,940 35	69,190 15	80,620 31
14,680 12	16,086 81	.....	5,324 87	5,862 16	25,365 04	24,130 42
.....
10,000 00	7,500 00	.....	.....	5,157 50	10,980 79	12,884 05
4,680 12	8,586 81	.....	5,324 87	704 66	14,384 25	11,246 37

"f" 4 months' operation.

"p" 13 months' operation.

xa, xd, xe See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality	Kitchener		Peterboro'		
Population	xe		xb		
	1915	1916	1914	1915	1916
EARNINGS			e		
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	19,108 60	20,876 63	8,661 71	27,991 24	31,020 72
Commercial Light	16,807 15	17,323 67	7,749 91	27,563 41	26,403 82
Power	54,732 50	62,436 31	7,013 23	30,185 83	36,597 04
Street Light	17,017 43	18,621 19	3,081 59	12,294 64	13,257 49
Miscellaneous	2,714 76	2,428 77	.....	.....	.....
Total	110,380 44	121,686 57	26,506 44	98,035 12	107,279 07
EXPENSES					
Power Purchased	47,644 33	59,814 81	11,920 90	45,240 12	48,888 66
Sub-Stn. Operation	3,727 21	3,888 64	840 05	3,269 50	2,498 52
“ “ Maint'ce... ..	465 16	621 93	9 08	313 85	464 58
Dist. System, Operation and Maintenance	4,193 45	4,392 79	996 31	4,632 71	7,963 09
Line Transformer M't'c'e.	21 76	28 05	26 35	178 43	387 43
Meter Maintenance.....	384 57	442 18	6 52	1,326 47	1,242 59
Consumers' Premises—Exp.	127 92	24 07	.....	.....	.....
Street Light Sys., Opera- tion and Maintenance..	1,699 89	1,976 07	1,465 01	6,000 91	5,367 18
Promotion of Business ..	169 29	118 17	.....	.....	.....
Billing and Collecting ...	2,569 37	2,809 95	242 70	2,125 05	2,865 07
Gen. Office, Sal. and Exp..	2,686 19	2,603 33	3,777 45	9,542 34	7,617 20
Undistributed Expenses ..	2,427 57	2,099 02	214 94	821 47	1,756 07
Int. and Deb. Payments..	18,436 93	18,474 43	2,026 21	13,372 97	11,981 33
Miscellaneous Expenses ..	b 1,265 63	b 1,244 84	.....	.....	.....
Total Expenses	85,819 27	98,538 28	21,525 52	86,823 82	91,031 72
Surplus	24,561 17	23,148 29	4,980 92	11,211 30	16,247 35
Loss					
Depreciation Charge .	13,500 00	14,638 25	.....	7,500 00	6,250 00
Surp. Less Depr. Chg.	11,061 17	8,510 04	4,980 92	3,711 30	9,997 35

"b" Patriotic Fund contribution.

"e" 3 months' operation.

xb, xe See page 68.

“ C ”—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

St. Catharines			St. Thomas			
xa 17,880			xc 17,174			
1914	1915	1916	1913	1914	1915	1916
e						
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
2,013 49	9,540 70	16,419 57	11,125 50	13,221 00	16,517 37	20,210 52
412 75	3,810 11	5,925 49	16,097 41	13,480 75	13,422 48	15,145 47
12,742 98	25,193 30	40,688 67	36,550 26	44,247 13	44,780 45	46,698 91
944 63	11,579 42	15,261 33	10,989 22	11,025 36	14,199 64	14,690 24
44 28	522 83	519 18	361 15	869 76	984 54	1,413 94
16,158 13	50,646 36	78,814 24	75,124 04	82,844 00	89,904 48	98,159 08
9,328 14	19,191 12	29,827 81	31,435 85	38,279 18	44,655 44	47,539 96
579 90	1,617 35	2,235 46	2,452 25	2,571 06	2,567 38	2,575 16
46 19	237 97	53 27	913 99	80 40	107 33	603 07
249 06	2,069 73	1,994 66	1,580 22	2,989 04	5,392 80	3,621 55
640 56	242 25	1,290 92	47 57	77 64	154 75	47 02
152 97	254 38	221 07	53 40	183 34	170 35	77 42
.....	.....	.....	.....	.....	.....	75 77
443 16	1,281 13	1,693 72	2,405 21	3,023 53	2,454 54	2,834 07
981 77	1,459 99	1,238 73	.....	.....	1,224 10	707 81
107 00	984 37	871 98	339 43	1,604 98	1,393 43	1,593 06
607 53	4,213 82	5,496 64	1,593 77	2,733 80	3,037 32	2,949 91
.....	250 93	555 21	739 67	967 72	2,248 54	1,934 95
1,105 87	9,724 03	12,411 67	7,402 65	7,406 14	8,359 74	8,314 07
.....
14,242 15	41,527 07	57,891 14	48,964 01	59,915 83	71,765 72	72,873 82
1,915 98	9,119 29	20,923 10	26,160 03	22,927 17	18,138 76	25,285 26
.....
850 00	7,250 00	10,500 00	6,900 00	7,350 00	8,735 00	9,800 00
1,065 98	1,869 29	10,423 10	19,260 03	15,577 17	9,403 76	15,485 26

“ e ”—3 months' operation.
xa, xc See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Stratford xb 17,081				Guelph 16,735 xc
—	1913	1914	1915	1916	1913
EARNINGS					
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	11,636 59	15,180 91	16,967 58	20,108 76	11,528 09
Commercial Light	17,033 98	16,336 30	14,766 75	14,803 08	15,075 61
Power	15,123 78	16,519 24	18,178 84	23,506 12	42,091 34
Street Light	12,120 00	12,120 00	15,466 32	15,753 20	9,500 04
Miscellaneous	69 33	1,319 04	1,449 46	760 70	2,531 74
Total	55,983 68	61,475 49	66,828 95	74,931 86	80,726 82
EXPENSES					
Power Purchased	22,028 75	25,875 69	31,081 79	37,453 45	32,473 66
Sub-Stn. Operation	1,651 06	1,557 16	1,752 93	1,615 03	1,700 14
“ “ Maint'ce... ..	200 54	16 70	71 99	391 78	1,076 44
Dist. System, Operation and Maintenance	1,630 72	2,515 22	1,985 74	1,896 78	3,004 51
Line Transformer M't'c'e.	148 48	1 56	44 37	19 20	179 90
Meter Maintenance.....	261 33	37 34	153 44	76 04	585 91
Consumers' Premises—Exp.	501 90	.....	.....	.....	206 39
Street Light Sys., Opera- tion and Maintenance..	1,509 91	926 11	1,627 04	1,056 63	1,566 58
Promotion of Business ..	.....	62 45	15 37	.....	.....
Billing and Collecting ...	1,325 47	1,647 47	2,007 92	1,948 60	430 35
Gen. Office, Sal. and Exp..	2,339 27	1,918 44	1,900 16	1,577 91	3,424 77
Undistributed Expenses ..	211 15	1,211 78	1,934 03	2,497 66	1,730 98
Int. and Deb. Payments..	10,536 75	12,989 75	14,398 80	14,794 02	10,273 27
Miscellaneous Expenses ..	.....	b 1,750 00	b 3,752 52	.....	x 884 95
Total Expenses	42,345 33	50,724 89	60,726 10	63,327 10	57,567 85
Surplus	13,638 35	10,750 60	6,102 95	11,604 76	23,158 97
Loss .....	.....	.....	.....	.....	.....
Depreciation Charge .	3,420 00	4,631 50	5,250 00	7,500 00	8,000 00
Surp. Less Depr. Chg.	10,218 35	6,119 10	852 86	4,104 76	15,158 97

“ b ” Patriotic Fund contributions.

“ x ” Motor repairs.

xb, xc See page 68.

"C"—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Guelph xc 16,735			Port Arthur xg 14,307			
1914	1915	1916	1913	1914	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
16,920 54	15,514 10	17,221 76	81,830 66	38,097 65	32,048 37	31,152 52
15,923 51	12,692 86	13,710 72	h 32,933 91	32,933 91	28,662 58	27,439 63
38,148 46	38,404 28	48,369 83	78,193 51	92,804 49	85,060 78	96,913 51
9,590 66	9,298 95	9,518 72	14,709 41	15,458 88	15,514 61	15,207 40
1,516 42	1,947 98	2,710 64	.....	.....	1,247 52	269 92
82,099 59	77,858 17	91,531 67	174,733 58	179,294 93	162,533 86	170,982 98
30,460 41	37,292 12	45,528 08	43,664 83	53,412 42	54,667 89	54,798 85
540 50	1,254 90	43 22	3,652 53	3,268 30	7,173 12	5,783 85
733 05	1,468 03	1,255 04	2,140 94	4,323 79	.....	585 15
3,897 65	1,592 39	1,888 83	9,013 80	8,003 88	6,357 20	2,987 89
161 05	240 75	148 83	1 75	454 62	284 10	695 92
711 63	756 35	912 62	112 13	670 91	827 62	1,228 18
.....	.....	.....	322 64	945 31	239 00	.....
1,380 19	1,343 16	1,236 44	1,543 03	2,146 96	1,764 92	1,297 59
.....	.....	.....	361 85	100 85	416 67	102 95
2,257 35	2,695 89	2,616 35	2,630 19	5,324 25	3,296 52	2,261 85
3,003 77	3,710 93	3,233 54	2,613 61	2,557 42	8,163 89	9,290 32
2,351 61	2,943 66	3,393 91	2,012 67	2,357 63	685 08	1,199 83
10,273 27	10,273 28	10,273 28	37,556 73	40,489 67	49,132 16	47,428 64
x 834 02	x 976 72	x 1,927 63	.....	.....	965 05	.....
56,604 50	64,548 18	72,457 77	105,626 70	124,056 01	133,973 22	127,661 02
25,495 09	13,309 99	19,073 90	69,106 88	55,238 92	28,560 64	43,321 96
.....
10,200 00	10,500 00	10,700 00	13,647 55	16,469 79	11,723 21	.....
15,295 09	2,809 99	8,373 90	55,459 33	38,769 13	16,837 43	43,321 96

"x" Motor repairs.

xc, xg See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Chatham xa 12,863		Owen Sound xf 11,910	Galt xa 11,852		
—	1915	1916	1916	1913	1914	1915
EARNINGS	m					
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	5,581 54	10,155 37	16,003 61	10,535 38	15,797 16	17,024 42
Commercial Light	2,806 81	7,427 36	23,724 21	11,648 49	11,952 75	8,794 36
Power	449 70	3,766 37	13,772 61	16,575 61	23,826 87	30,547 84
Street Light	7,616 36	13,169 02	7,000 00	6,280 25	8,500 00	12,981 29
Miscellaneous		396 34	700 70	194 00	919 15	373 24
Total	16,454 41	34,914 46	61,201 13	45,233 73	60,995 93	69,721 15
EXPENSES						
Power Purchased	7,171 72	15,427 10	25,067 12	17,883 91	21,134 48	29,961 84
Sub-Stn. Operation	318 56	1,053 43	5,439 60	1,761 14	1,930 96	2,283 95
“ “ Maint'ce..	23 48	50 20	.....	180 76	99 42	280 66
Dist. System, Operation and Maintenance	102 09	839 35	2,742 65	446 24	1,729 80	1,499 76
Line Transformer M't'c'e.	15 25	68 62	468 48	11 48	129 05	120 76
Meter Maintenance.....	45 94	92 43	318 35	2 00	91 88	57 81
Consumers' Premises-Exp.		535 22	.....		208 64	.....
Street Light Sys., Opera- tion and Maintenance..	396 40	1,817 32	2,806 42	296 88	2,234 06	3,066 10
Promotion of Business ..	326 00	353 85	.....	.....	.....	.....
Billing and Collecting ...	810 65	1,624 56	1,119 74	1,188 20	1,868 30	2,226 16
Gen. Office, Sal. and Exp..	1,630 14	2,079 44	3,120 54	1,792 40	1,618 71	2,713 64
Undistributed Expenses ..	871 85	1,515 83	806 41	.....	187 55	475 21
Int. and Deb. Payments..	5,463 85	8,855 45	11,281 56	9,721 64	10,337 35	13,269 15
Miscellaneous Expenses ..		.....	.....	.....	.....	.....
Total Expenses	17,175 88	34,312 80	53,170 87	33,284 65	41,570 20	55,955 04
Surplus		601 66	8,030 26	11,949 08	19,425 73	13,766 11
Loss	721 47	.....	.....	.....	.....	.....
Depreciation Charge ..	.....	.....	3,307 80	8,400 00	10,600 00	10,000 00
Surp. Less Depr. Chg.	721 47	601 66	4,722 46	3,549 08	8,825 73	3,766 11

“m” 10 months' operation.

Italics denote losses.

xa, xf See page 68.

"C"—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Galt xa 11,852	Sarnia xa 11,676	Niagara xa Falls 11,147	Woodstock xb 10,084				Brockville xf 9,428
			1913	1914	1915	1916	
1916	1916	1916	1913	1914	1915	1916	1916
		h					
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
19,961 17	.....	21,733 29	6,495 02	8,807 40	10,472 14	11,206 71	12,897 12
10,485 26	17,498 81	13,259 02	12,942 32	11,610 14	11,718 95	12,983 32	21,994 02
36,029 78	12,640 12	9,613 91	20,262 52	19,832 26	20,742 18	23,721 92	15,828 62
12,567 40	3,480 00	12,849 81	7,160 00	7,320 00	7,810 08	7,355 01	9,090 00
45 00	.....	9 84	354 18	471 80	673 97	1,360 65	.....
79,088 61	33,618 90	57,465 87	47,214 04	48,041 50	51,417 32	56,627 61	59,719 76
41,098 16	.....	15,391 75	18,798 66	18,690 30	20,217 74	24,747 98	8,754 44
2,774 79	9,289 42	3,516 04	1,834 83	2,149 53	1,817 22	1,924 83	14,304 71
89 72	.....	.....	497 39	83 02	108 46	33 08	2,878 57
1,795 06	642 75	4,272 18	1,827 65	1,566 91	1,654 10	2,068 72	1,955 01
15 55	4 00	197 54	4 84	23 75	74 94	128 08	17 59
185 80	.....	560 67	70 75	57 05	24 82	313 11	219 29
160 76	.....	.....	345 00	.....	.....	.....	.....
2,620 53	137 26	3,959 08	1,142 30	1,665 72	584 03	502 77	494 27
.....	.....	.....	.....	.....	.....	.....	851 48
2,566 98	.....	1,795 99	1,115 75	1,628 44	1,443 25	1,722 35	566 28
3,298 27	3,843 56	2,548 06	2,513 73	3,050 10	3,007 93	2,794 11	2,648 31
603 80	1,037 33	1,920 19	447 96	581 45	972 96	1,077 89	892 28
15,303 85	7,738 92	9,078 40	6,853 83	7,219 04	7,290 95	7,241 71	15,535 74
.....	.....	.....	.....	500 00	1,000 00	b 1,000 00	b 1,325 54
70,513 27	22,693 24	43,239 90	35,806 87	37,215 31	38,196 40	43,554 63	50,443 51
8,575 34	10,925 69	14,225 97	11,407 17	10,826 38	13,220 92	13,072 98	9,276 25
.....
8,500 00	.....	8,315 00	5,827 40	6,450 00	6,725 00	6,930 20	7,000 00
75 34	10,925 69	5,910 97	5,579 77	4,376 38	6,495 92	6,142 78	2,276 25

"b" Patriotic Fund contributions.

"h" 6 months' operation.

xa, xb, xf See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Welland 7,243				Barrie 6,453		
	1913	1914	1915	1916	1913	1914	1915
EARNINGS	f						
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	1,369 67	4,411 20	4,643 16	4,800 06	10,071 55	11,149 49	11,087 68
Commercial Light	558 46	1,676 38	1,600 79	1,580 48	9,252 70	9,464 64	9,572 91
Power	4,307 21	8,305 71	38,541 88	78,184 81	3,393 45	3,712 24	4,567 76
Street Light	1,395 00	5,049 00	5,235 75	5,181 00	4,292 53	4,572 75	5,075 00
Miscellaneous			1,171 16	3,899 76	583 28	137 89	145 51
Total	7,630 34	19,442 29	51,192 74	98,646 11	27,593 51	29,037 01	30,448 86
EXPENSES							
Power Purchased	4,861 38	7,598 77	31,100 96	62,152 76	6,611 27	10,873 86	12,352 71
Sub-Stn. Operation	295 43	406 99	208 78	1,115 16	5,706 97	2,745 68	2,428 00
“ “ Maint'ce.		32 30	96 66	387 59			
Dist. System, Operation and Maintenance.....	191 18	138 94	590 33	841 42	679 16	448 87	1,008 10
Line Transformer M't'c'e.	32 82	107 53	318 22	1,010 32			58 50
Meter Maintenance.....	50	57 21	200 13	228 68	17 92		151 73
Consumers' Premises-Ex.							
Street Light Sys., Opera- tion and Maintenance...	123 82	446 23	192 52	156 28	402 06	108 02	675 44
Promotion of Business...							
Billing and Collecting...	317 42	748 38	455 39	541 14			
Gen. Office, Sal. and Exp.	798 53	2,790 59	3,720 01	5,431 25	3,578 67	2,294 92	2,567 43
Undistributed Expenses..	39 45	10 25	420 97	624 60	544 58	510 67	1,174 97
Int. and Deb. Payments..	2,638 54	5,080 20	8,474 79	8,199 77	5,590 40	6,052 29	6,052 29
Miscellaneous Expenses..							
Total Expenses.....	9,299 07	17,417 39	45,778 76	80,688 97	23,131 03	23,044 31	26,469 17
Surplus.....		2,024 90	5,413 98	12,957 14	4,462 48	5,992 70	3,979 69
Loss.....	1,668 73						
Depreciation Charge..			4,425 00	4,000 00	3,350 00	3,500 00	3,500 00
Surp. Less Depr. Chg.	1,668 73	2,024 90	988 98	8,957 14	1,112 48	2,492 70	479 69

"f" 4 months' operation.

Italics denote losses.

xa, xb See page 68.

“C”—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Barrie xb 6,453	Collingwood xb 6,361				Midland xb 6,258			
	1913	1914	1915	1916	1913	1914	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
11,907 10	8,775 83	7,857 86	7,094 27	8,320 44	6,095 11	6,941 07	6,580 45	7,145 74
10,635 67	7,600 00	7,555 54	5,688 26	6,213 86	6,104 16	5,048 06	4,462 54	4,624 85
6,918 33	896 72	5,165 39	9,527 70	23,152 41	5,700 22	6,484 43	10,229 52	12,262 89
5,323 67	3,802 88	4,647 00	4,715 00	3,940 00	3,463 07	3,728 76	3,100 00	3,330 46
237 09	106 21	.....	.....	91	.....	13 71	33 26	113 10
35,021 86	21,181 64	25,225 79	27,025 23	41,627 62	21,362 56	22,216 03	24,405 77	27,477 04
14,417 95	7,480 48	10,450 24	13,733 50	24,922 78	6,059 33	6,539 10	8,367 74	11,787 55
1,254 53	1,952 60	2 25	.....	.....	.....	.....	.....	.....
.....	.....	10 51	3 97	.....	.....	.....	.....	.....
182 06	1,374 21	749 16	530 27	493 42	989 11	1,284 29	1,104 58	981 34
.....	9 19	36 83	.....	.....	57 20	420 06	122 60	35 34
1,039 54	13 37	15 25	.....	98 44	.....	.....	.....	605 31
.....
506 46	133 20	664 19	477 36	382 60	526 53	1,020 22	1,020 86	961 47
.....
.....	252 08	302 39	526 63	816 33	221 04	157 39	282 69	494 20
2,560 26	2,066 94	1,916 97	1,988 80	1,988 08	1,435 86	1,692 75	2,088 31	1,771 67
726 93	209 90	173 18	128 76	.....	.....	107 63	.....	175 46
6,052 29	4,277 77	4,369 96	3,556 84	3,393 33	4,134 55	4,267 05	3,827 60	3,955 47
.....	.....	250 00	.....	.....	.....	.....	.....	.....
26,740 02	17,769 94	18,690 93	21,196 13	32,094 98	13,423 62	15,488 49	16,814 39	20,767 81
8,281 84	3,411 70	3,534 86	5,829 10	9,532 64	7,938 94	6,727 54	7,591 39	6,709 23
.....
2,575 00	2,390 00	2,400 00	2,600 00	2,150 00	2,950 00	3,200 00	3,400 00	3,100 00
5,706 84	1,021 70	4,134 86	3,229 10	7,382 64	4,988 94	3,527 54	4,191 39	3,609 23

xb See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Ingersoll xb 5,176				Walkerville xa 5,096	
	1913	1914	1915	1916	1914	1915
EARNINGS						
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	3,595 03	5,085 82	5,480 52	6,857 94	337 96	12,640 03
Commercial Light	6,048 51	6,359 72	5,716 91	6,540 51	1,492 84	7,596 25
Power	15,293 44	12,818 27	16,251 18	20,380 90	6,042 11	38,580 74
Street Light	4,262 02	3,960 04	3,564 80	3,729 00	1,716 61	3,601 29
Miscellaneous	976 99	250 88	610 56	681 28	.....	982 28
Total	30,176 00	28,474 73	31,623 97	38,189 63	12,289 52	63,400 59
EXPENSES						
Power Purchased	11,966 61	11,441 79	16,994 84	20,236 43	6,104 53	45,503 27
Sub-Stn. Operation	828 83	907 02	852 02	1,144 36	259 76	1,425 79
“ “ Maint'ce. ....	.....	.....	.....	.....	1 75	39 86
Dist. System, Operation and Maintenance	422 13	535 79	446 05	1,219 74	502 81	1,132 37
Line Transformer M't'c'e.	187 39	113 54	277 77	47 31	3 00	163 19
Meter Maintenance.....	97 00	360 05	297 19	81 59	13 25	217 05
Consumers' Premises-Exp.	.....	.....	.....	.....	.....	.....
Street Light Sys., Opera- tion and Maintenance..	440 09	274 54	214 69	414 97	10 58	749 88
Promotion of Business ..	.....	.....	.....	.....	.....	.....
Billing and Collecting ...	560 15	543 73	668 26	834 79	562 05	2,039 70
Gen. Office, Sal. and Exp..	1,615 40	1,471 88	1,561 32	1,024 03	1,499 11	2,806 63
Undistributed Expenses ..	195 56	71 63	82 63	590 85	374 34	923 24
Int. and Deb. Payments..	5,337 25	5,198 90	5,046 35	4,905 00	1,908 19	8,758 92
Miscellaneous Expenses ..	.....	.....	.....	.....	.....	.....
Total Expenses	21,650 41	20,918 87	26,441 12	30,499 07	11,239 37	63,759 90
Surplus	8,525 59	7,555 86	5,182 85	7,690 56	1,050 15	.....
Loss .....	.....	.....	.....	.....	.....	359 31
Depreciation Charge .	2,862 00	3,168 00	3,200 00	2,650 00	.....	.....
Surp. Less Depr. Chg.	5,663 59	4,387 86	1,982 85	5,040 56	1,550 15	359 31

Italics denote losses.

xa xb See page 68.

“C”—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Walkerville xa 5,096	Waterloo xf 4,956				Goderich xb 4,655		
1916	1913	1914	1915	1916	1914	1915	1916
	p						
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
18,610 61	4,263 66	4,723 94	5,401 82	5,454 60	7,197 05	6,072 51	7,086 32
11,805 00	5,098 42	4,825 22	5,284 87	4,750 09	4,196 49	5,066 76	5,253 15
76,567 87	14,970 14	13,282 12	15,125 32	17,905 45	1,240 73	5,645 26	5,498 56
3,828 49	5,294 10	5,137 84	5,773 20	5,798 75	5,525 00	5,525 00	5,162 39
1,653 93		477 61	276 14	834 92			135 00
112,465 90	29,626 32	28,446 73	31,861 35	34,743 81	18,159 27	22,309 53	23,135 42
75,704 99	11,075 53	9,882 03	14,230 85	16,914 08	6,315 17	7,716 02	9,136 85
1,994 86	1,019 10	924 41	863 04	890 01	1,806 40	1,705 39	1,461 80
250 24	81 00	182 23	315 50	47 74			
976 49	378 74	794 51	2,013 65	1,479 03	167 83	312 13	525 44
399 31	32 13	42 90	2 65	74 95	11 25	113 65	314 94
543 58	54 67	193 53	61 72	106 32	15 94	13 43	
1,103 25	1,093 25	459 21	869 98	693 68	68 20	413 67	727 63
2,183 61	866 90	756 25	926 41	1,021 01	343 13	405 95	494 19
5,585 79	2,520 00	2,519 64	2,463 40	3,064 05	204 85	185 28	813 59
3,023 92	709 44	323 72	431 95	473 57	154 40	113 35	119 44
11,092 60	3,676 92	3,473 33	4,284 71	3,475 25	4,182 09	4,447 27	5,302 27
102,858 64	21,507 68	19,551 76	26,463 86	29,139 69	13,269 26	15,426 14	18,896 15
9,607 26	8,118 64	8,894 97	5,397 47	5,604 12	4,890 01	6,883 39	4,239 27
3,773 06	3,100 00	3,500 00	4,000 00	3,700 00	2,920 00	3,750 00	2,600 00
5,834 20	5,018 64	5,394 97	1,397 49	1,904 12	1,970 01	3,133 39	1,639 27

“p” 13 months’ operation.
xa xb, xf See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality	Dundas				Preston	
Population	xb 4,652				xb 4,643	
—	1913	1914	1915	1916	1913	1914
EARNINGS						
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	3,045 85	5,349 24	6,139 97	6,925 46	5,477 10	6,520 39
Commercial Light	4,193 27	4,198 64	4,310 96	4,714 78	5,366 77	5,011 15
Power	3,070 40	4,305 96	5,930 54	10,915 58	21,017 68	21,975 26
Street Light	60 10	3,050 85	3,460 35	3,547 73	2,594 55	2,778 48
Miscellaneous	930 81				232 47	98 53
Total	11,300 43	16,904 69	19,841 82	26,103 55	34,688 57	36,383 81
EXPENSES						
Power Purchased	3,474 08	4,038 10	4,981 97	7,411 36	16,673 20	17,460 00
Sub-Stn. Operation			71 64	17 89	1,459 16	1,509 01
“ “ Maint'ce.					49 21	28 33
Dist. System, Operation and Maintenance	154 77	840 00	1,448 70	822 50	1,238 36	2,368 26
Line Transformer M't'c'e.	35 80	74 75	91 00	125 18	280 22	139 99
Meter Maintenance.....	4 40	31 18	61 42	36 86	79 67	86 01
Consumers' Premises—Exp.		84 68	28 54			
Street Light Sys., Opera- tion and Maintenance..		285 34	378 76	369 73	431 92	523 05
Promotion of Business ..		789 93				
Billing and Collecting ...	689 51	937 59	1,026 26	1,120 00	656 75	739 90
Gen. Office, Sal. and Exp..	1,642 56	1,876 50	1,905 51	1,732 83	415 98	568 69
Undistributed Expenses ..		138 32	898 42	1,467 23	183 85	585 82
Int. and Deb. Payments..	1,970 14	4,504 12	5,706 69	5,565 39	4,120 54	7,300 84
Total Expenses	7,971 26	13,600 51	16,598 91	18,668 97	25,588 86	31,309 90
Surplus	3,329 17	3,304 18	3,242 91	7,434 58	9,099 71	5,073 91
Loss						
Depreciation Charge .	1,508 00	1,675 00	2,900 00	2,830 00	2,924 00	3,400 00
Surp. Less Depr. Chg.	1,821 17	1,629 18	342 91	4,604 58	6,175 71	1,673 91

xb See page 68.

"C"—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Preston xb 4,643		Paris xb 4,370			Wallaceburg xb 4,107	
1915	1916	1914	1915	1916	1915	1916
					n	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
6,615 91	7,341 15	4,766 23	5,071 54	5,877 57	4,079 74	5,095 45
4,488 76	4,779 76	2,778 00	4,063 03	3,805 95	4,239 30	4,589 30
21,698 34	22,624 37	1,419 90	6,328 33	8,974 66	87 32	5,866 32
2,830 50	3,044 92	4,103 00	4,576 00	4,576 00	2,680 61	3,094 56
15 00						
35,648 51	37,790 20	13,067 22	20,937 90	23,234 18	11,086 97	18,645 63
18,843 12	20,693 58	4,020 80	7,104 77	7,837 15	5,601 51	9,464 40
1,667 38	1,727 51	1,082 57	1,647 07	1,387 25		59 43
30 10	211 78					
1,656 67	1,093 91	1,299 26	1,325 58	1,299 93	143 88	729 31
149 14	197 11	13 45	20 00			
56 28	145 13		2 05	7 60		129 79
413 40	297 29	333 09	493 88	281 48	295 13	563 91
822 42	1,046 83			83 50		
496 56	956 13	563 26	746 78	636 17	1,377 06	1,955 13
1,340 06	531 01	115 30	100 00	348 64		909 46
7,212 87	7,258 79	5,849 94	7,966 15	6,665 00	3,580 84	3,701 50
32,688 00	34,159 07	13,277 67	19,406 28	18,546 72	10,998 42	17,512 93
2,960 51	3,631 13		632 62	4,687 46	88 85	1,132 70
		210 45				
3,800 00	3,500 00			2,000 00		1,038 00
839 49	131 13	210 45	632 62	2,687 46	88 85	94 70

"n" 11 months' operation.

Italics denote losses.

xb See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Simcoe xa 4,061		Brampton xb 4,041			
	1915	1916	1913	1914	1915	1916
EARNINGS						
	l					
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	351 67	857 61	5,617 61	6,798 89	6,860 48	6,660 66
Commercial Light	1,386 89	2,292 28	3,983 65	4,055 99	4,053 56	4,013 51
Power	766 42	1,386 33	10,557 72	10,658 33	11,624 83	12,922 72
Street Light	2,708 51	3,500 00	3,500 00	4,200 00	4,486 00	4,262 17
Miscellaneous	12 80	128 99	.....	.....	62 71	269 05
Total	5,226 29	8,165 21	23,661 98	25,713 21	27,087 58	28,128 11
EXPENSES						
Power Purchased	2,438 62	3,531 25	11,084 34	11,692 39	13,259 58	14,489 32
Sub-Stn. Operation		4 70	26 11	58 58	30 95	25 68
“ “ Maint'ce.						
Dist. System, Operation and Maintenance	3 70	40 48	231 54	522 54	1,032 33	954 36
Line Transformer M't'ce.		26 37	16 00	197 15	150 45	.....
Meter Maintenance		12 10	.....	51 31	13 15	38 42
Consumers' Premises—Exp. Street Light Sys., Opera- tion and Maintenance..	19 81	59 45	168 79	429 60	282 72	191 62
Promotion of Business ..						
Billing and Collecting ..			341 70	794 57	871 46	935 76
Gen. Office, Sal. and Exp..	441 53	1,020 71	1,694 67	1,904 94	1,854 65	1,744 33
Undistributed Expenses ..	232 50	124 65	371 28	66 47	28 12	147 14
Int. and Deb. Payments..	1,473 94	1,948 91	3,781 42	4,936 36	4,799 34	4,739 19
Total Expenses	4,610 10	6,768 62	17,716 05	20,653 91	22,322 75	23,265 82
Surplus	616 19	1,396 59	5,945 93	5,059 30	4,764 83	4,862 29
Loss						
Depreciation Charge ..		1,350 00	2,500 00	3,000 00	3,000 00	3,000 00
Surp. Less Depr. Chg.	616 19	46 59	3,445 93	2,059 30	1,764 83	1,862 29

“1” 9 months' operation.

xa, xb See page 68.

"C"—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

St. Marys 3,958				Penetanguishene 3,928				Petrolia 3,891 xa
xb				xb				
1913	1914	1915	1916	1913	1914	1915	1916	1916
								j
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
3,815 77	4,614 95	5,073 97	5,020 33	1,989 80	1,936 73	2,050 69	2,314 37	1,598 03
4,553 73	4,733 33	4,222 53	3,161 26	4,511 16	3,064 83	2,676 60	2,706 74	1,840 35
8,221 72	10,610 05	8,379 87	9,266 74	8,775 95	8,001 69	10,048 08	11,650 03	356 67
3,582 00	3,441 00	3,850 00	5,390 33	2,042 00	2,016 00	2,095 00	2,095 00	2,074 32
		178 00				148 35	17 70	195 95
20,173 22	23,399 33	21,704 37	22,838 66	17,318 91	15,019 25	17,018 72	18,783 84	6,065 32
10,055 82	8,966 67	9,040 90	10,411 47	6,347 56	7,673 95	9,935 27	11,954 10	2,818 60
728 39	803 25	729 98	784 83	967 84	725 24	734 23	742 17	
150 46	195 00		100 67		3 25	1 66		
556 05	400 29	582 11	475 54	301 41	166 21	92 25	78 45	
519 39	350 34	136 96	245 73	236 11	93 51	1 00	7 70	
202 56	175 22	102 77	196 43		178 86	27 60	182 69	
554 36	423 60	502 85	640 39	144 56	335 99	373 93	220 76	143 29
					131 74	58 88		
263 21	257 03	296 57	238 61	44 45	133 00	227 56	196 25	
1,077 38	994 13	1,143 40	964 08	1,278 02	1,305 25	1,303 05	1,260 29	1,422 41
75 63	138 54	72 80	528 22		3 00		216 66	
4,616 15	4,658 00	4,775 42	4,775 42	2,035 90	1,986 09	1,981 39	2,050 40	1,486 24
18,799 40	17,362 07	16,507 87	19,361 39	11,355 85	12,736 09	14,736 82	16,909 47	5,994 49
1,373 82	6,037 26	4,320 61	3,477 27	5,963 06	2,283 16	2,281 90	1,874 37	70 83
	3,340 00	3,600 00	2,900 00	1,820 00	1,960 00	2,000 00	1,780 00	
1,373 82	2,697 26	720 61	577 27	4,143 06	323 16	281 90	94 37	70 83

"j" 7 months' operation.

xa, xb See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Tillsonburg xb 3,084				Strathroy xb 2,998	
	1913	1914	1915	1916	1915	1916
EARNINGS						
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	2,796 57	3,367 74	3,203 51	4,009 67	3,380 78	3,318 45
Commercial Light	4,677 38	4,579 37	4,236 42	4,493 51	4,701 76	3,817 38
Power	4,763 13	6,303 09	5,619 15	5,692 05	700 49	2,927 36
Street Light	2,601 00	2,463 96	2,507 81	2,595 96	4,221 76	4,654 59
Miscellaneous	1,163 11	863 28	667 61	436 69	.....	368 88
Total	16,001 19	17,577 44	16,234 50	17,227 88	13,004 79	15,086 66
EXPENSES						
Power Purchased	6,249 35	6,999 79	7,248 93	7,761 57	5,541 40	7,507 66
Sub-Stn. Operation	950 05	753 91	713 91	750 71	.....	.....
“ “ Maint'ce. ....	.....	.....	.....	.....	.....	.....
Dist. System, Operation and Maintenance	332 50	570 90	471 99	333 93	78 62	75 14
Line Transformer M't'c'e.	4 89	11 55	.....	.....	.....	.....
Meter Maintenance .....	.....	16 47	4 40	19 68	.....	.....
Consumers' Premises-Exp. ....	.....	.....	.....	.....	.....	.....
Street Light Sys., Opera- tion and Maintenance..	205 87	210 50	309 17	161 04	160 10	187 91
Promotion of Business ..	.....	.....	43 29	36 95	.....	.....
Billing and Collecting ...	907 04	923 46	1,003 63	993 63	.....	.....
Gen. Office, Sal. and Exp..	1,064 21	997 04	1,306 50	1,654 61	1,353 44	1,898 60
Undistributed Expenses ..	1,033 61	1,000 00	.....	50 38	.....	.....
Int. and Deb. Payments..	2,137 07	2,727 41	2,674 75	2,594 83	2,719 74	2,188 26
Total Expenses	12,884 59	14,211 21	13,776 57	14,357 33	9,853 30	11,857 57
Surplus	3,116 60	3,366 23	2,457 93	2,870 55	3,151 49	3,229 09
Loss .....	.....	.....	.....	.....	.....	.....
Depreciation Charge ..	1,782 75	1,830 00	1,875 00	1,600 00	1,500 00	1,050 00
Surp. Less Depr. Chg.	1,333 85	1,536 23	582 93	1,270 55	1,651 49	2,179 09

xb See page 68.

“C”—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Hespeler				Prescott			Orange-ville
2,740				2,740			2,493
xb				xb			xa
1913	1914	1915	1916	1914	1915	1916	1916
							g
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
2,206 75	2,635 41	2,787 48	3,011 73	7,472 75	4,058 14	4,186 96	613 08
1,667 00	1,934 75	2,334 15	2,012 28	1,996 00	3,033 62	3,611 95	722 87
5,044 30	6,116 27	9,017 58	11,177 71	1,099 27	3,431 45	4,141 90	866 11
1,500 00	1,478 00	1,536 00	1,831 80	2,500 00	2,500 00	2,500 00	760 00
.....	.....	.....	.....	9 00	.....	117 39	127 27
10,418 05	12,164 43	15,675 21	18,033 52	12,077 02	13,023 21	14,558 20	3,089 33
5,465 01	4,753 26	6,663 89	9,755 25	5,047 30	4,552 99	4,603 77	1,379 12
2,101 87	614 43	413 06	839 98	3,293 49	1,147 65	2,317 58	.....
.....	.....	.....	.....	361 49	805 14	47 63	.....
638 83	565 16	431 37	626 62	767 49	929 36	1,247 01	39 40
4 17	54 05	52 76	.....	.....	34 00	.....	.....
.....	.....	.....	147 22	116 10	146 70	27 80	.....
.....
57 50	111 92	139 02	165 66	119 00	210 22	520 60	64 72
.....
.....	.....	.....	.....	37 82	81 94	22 17	.....
735 23	1,207 23	481 99	1,367 10	1,165 23	1,503 78	1,538 89	750 53
272 67	112 50	112 50	137 50	169 62	260 23	166 90	.....
2,140 19	3,144 33	3,144 33	3,144 34	1,722 31	2,233 12	1,983 39	610 88
11,415 47	10,562 88	12,438 82	16,183 67	12,799 85	11,905 13	12,475 74	2,844 65
.....	1,601 55	3,236 29	1,849 85	.....	1,118 08	2,082 46	244 68
997 42	.....	.....	.....	700 06	.....	.....	.....
.....	1,350 00	1,400 00	1,075 00	1,950 00	2,000 00	1,880 00	.....
.....	251 55	1,836 29	774 85	2,650 06	881 92	202 46	244 68

“g” 5 months’ operation.
Italics denote losses.
xa, xb See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality	Listowel	Ridge- town	Elmira			Clinton
Population	2,326 xb	2,329 xa	xb	2,270		2,177 xb
—	1916	1916	1914	1915	1916	1914
EARNINGS	z		p			
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	*7,696 19	2,173 64	1,968 41	2,059 11	2,211 16	2,023 70
Commercial Light .....	.....	2,838 32	2,020 81	1,674 44	1,665 69	2,028 08
Power	605 03	740 86	1,876 49	2,801 33	2,635 22	1,255 33
Street Light	2,163 16	2,853 00	1,680 00	1,680 00	1,740 00	1,105 66
Miscellaneous .....	.....	390 90	.....	3 75	18 24	.....
Total	10,464 38	8,999 72	7,545 71	8,218 63	8,270 31	6,412 77
EXPENSES						
Power Purchased	2,010 78	3,950 44	3,077 56	3,361 63	3,494 69	2,291 20
Sub-Stn. Operation	2,121 60	.....	.....	.....	.....	911 74
“ “ Maint'ce. ....	.....	.....	.....	.....	.....	.....
Dist. System, Operation and Maintenance	351 71	215 56	.....	.....	.....	80 99
Line Transformer M't'c'e. ....	.....	.....	.....	.....	.....	.....
Meter Maintenance .....	.....	.....	.....	.....	.....	.....
Consumers' Premises—Exp. ....	.....	.....	.....	.....	.....	.....
Street Light Sys., Opera tion and Maintenance	73 29	23 27	102 55	83 64	148 96	145 74
Promotion of Business .....	.....	.....	.....	.....	.....	.....
Billing and Collecting .....	.....	.....	.....	.....	.....	.....
Gen. Office, Sal. and Exp.	2,569 12	1,114 21	1,170 47	1,090 84	1,122 04	1,182 42
Undistributed Expenses .....	.....	.....	31 17	.....	.....	32 29
Int. and Deb. Payments	2,928 48	1,840 86	1,425 22	1,356 67	1,377 58	1,838 56
Total Expenses	10,054 98	7,144 34	5,806 97	5,892 78	6,143 27	6,483 14
Surplus	409 40	1,855 38	1,738 74	2,325 85	2,127 04	.....
Loss .....	.....	.....	.....	.....	.....	70 37
Depreciation Charge .....	.....	425 00	650 00	750 00	620 00	.....
Surp. Less Depr. Chg.	409 40	1,430 38	1,088 74	1,575 85	1,507 04	70 37

* Domestic and Commercial not separable.

“ b ” 13 months' operation.

“ z ” 6 months Hydro; 6 months steam.

Italics denote losses.

xa, xb See page 68.

"C"—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Clinton xb 2,177		Weston xb 2,156				Milton xa 2,072			
1915	1916	1913	1914	1915	1916	1913	1914	1915	1916
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
2,930 57	3,161 29	4,117 20	3,741 84	4,407 36	5,477 65	1,149 28	1,961 22	1,981 80	2,219 28
3,068 63	3,064 37	1,475 74	1,599 97	1,305 90	1,407 31	1,212 26	2,226 80	1,900 98	1,892 21
2,108 24	2,498 64	6,170 36	4,958 59	4,798 33	5,202 84	6,462 38	11,325 61	5,364 29	10,428 79
1,630 40	1,650 00	2,052 00	3,067 50	2,684 67	3,692 00	900 00	1,350 00	1,575 00	2,013 20
118 31	273 61	24 88	.....	31 79	17 55	143 18	455 62	.....	262 42
9,856 15	10,647 91	13,840 18	13,367 90	14,228 05	15,797 35	9,867 10	17,319 25	10,822 07	16,815 90
3,835 94	4,190 07	5,159 49	5,783 87	5,536 71	6,121 26	4,902 34	7,696 45	6,511 50	9,332 39
911 51	.....	.....	.....	.....	.....	.....	.....	.....	.....
146 80	298 77	791 77	662 71	1,181 11	1,001 17	167 82	609 66	513 70	731 07
.....	.....	.....	.....	.....	.....	.....	.....	.....	417 42
298 61	106 26	574 25	451 99	419 20	189 66	.....	86 16	169 82	50 65
1,569 57	1,323 31	927 35	1,668 62	1,264 78	1,428 12	42 27	572 05	819 70	889 31
2,643 15	3,089 21	79 50	76 17	.....	.....	1,582 93	2,277 04	2,270 34	2,178 67
9,405 58	9,007 62	1,588 48	1,588 42	2,310 20	2,096 09	6,695 36	11,241 36	10,285 06	13,599 51
450 57	1,640 29	4,719 34	3,136 12	3,516 05	4,961 05	3,171 74	6,077 89	537 01	3,216 39
380 20	1,200 00	1,390 00	1,450 00	1,520 00	1,600 00	900 00	1,250 00	1,090 00	900 00
70 37	440 29	3,329 34	1,686 12	1,996 05	3,361 05	2,271 74	4,827 89	552 99	2,316 39

Italics denote losses.

xa, xb See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Mimico xa 1,976				Chesley 1,975 xa	Seaforth xh 1,964	
	1913	1914	1915	1916	1916	1913	1914
EARNINGS			†	†	g		
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	2,021 06	5,085 16	5,748 44	7,011 08	1,881 23	2,124 18	2,467 36
Commercial Light	*	*	346 49	506 44	*	2,876 47	2,581 30
Power	795 49	963 64	1,042 11	1,449 14	135 61	7,509 99	7,707 01
Street Light	987 00	1,049 34	2,015 66	2,496 75	521 65	1,815 81	1,869 96
Miscellaneous				52 23	49 89	61 63	110 14
Total	3,803 55	7,098 14	9,152 70	11,515 64	2,588 38	14,388 08	14,735 77
EXPENSES							
Power Purchased	1,740 66	2,801 90	3,342 50	4,217 02	1,332 68	7,931 55	8,646 18
Sub-Stn. Operation							
“ “ Maint'ce.							
Dist. System, Operation and Maintenance	144 79	53 29	167 16	698 69	25 98	1,573 93	1,078 00
Line Transformer M't'c'e.							
Meter Maintenance.							
Consumers' Premises-Exp. Street Light Sys., Opera- tion and Maintenance..	23 89	88 85	148 80	253 82	23 38	317 37	638 57
Promotion of Business ..							
Billing and Collecting ...							
Gen. Office, Sal. and Exp..	265 61	674 73	892 39	1,098 29	130 59	368 67	529 05
Undistributed Expenses ..							
Int. and Deb. Payments..	845 02	1,561 45	2,300 32	2,580 10	482 05	1,653 65	1,704 25
Total Expenses	3,019 97	5,180 22	6,851 17	8,847 92	1,994 68	11,845 17	12,596 05
Surplus	783 58	1,917 92	2,301 53	2,667 72	593 70	2,542 91	2,139 72
Loss							
Depreciation Charge ..	740 00	920 00	1,200 00	1,000 00		1,300 00	1,466 00
Surp. Less Depr. Chg.	43 58	997 92	1,101 53	1,667 72	593 70	1,242 91	739 72

* Domestic and Commercial not separable.

† Domestic includes Rural Revenue.

“g” 5 months' operation.

xa, xh See page 68.

"C"—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Seaforth xh 1,964		Mount Forest 1,941 xb	Georgetown xa 1,905				Fergus xh 1,776	
1915	1916	1916	1913	1914	1915	1916	1915	1916
			f				p	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
2,593 70	3,045 65	1,967 03	661 49	3,069 02	2,999 83	3,174 63	1,314 03	1,621 27
2,724 84	2,941 03	2,420 75	842 87	2,362 33	2,276 41	2,101 00	2,367 91	2,111 16
7,685 52	9,684 11	1,739 79	234 32	2,976 61	8,734 01	10,726 24	882 24	2,819 21
1,869 96	1,869 96	1,963 00	541 67	1,843 67	1,834 03	1,724 17	1,744 75	1,575 00
143 53	88 39	523 01	.....	.....	130 53	369 40	99 65	91 31
15,017 55	17,629 14	8,613 58	2,280 35	10,251 63	15,974 81	18,095 44	6,408 58	8,217 95
9,305 22	11,625 46	3,544 42	759 00	4,183 72	8,893 20	9,790 20	2,598 37	3,382 69
891 49	1,170 86	969 92	12 85	192 11	137 03	290 19	23 77	123 40
314 55	228 17	74 92	201 06	128 09	192 12	259 17	97 28	132 70
548 30	559 54	315 09	.....	895 46	955 08	1,102 70	1,208 84	681 81
1,662 37	1,695 75	1,622 33	.....	1,466 55	1,929 67	1,963 05	967 76	1,148 74
12,721 93	15,279 78	6,526 68	972 91	6,865 93	12,107 10	13,405 31	4,896 01	5,469 34
2,295 62	2,349 36	2,086 90	1,307 44	3,385 70	3,867 71	4,690 13	1,512 57	2,748 61
1,450 00	1,225 00	615 00	300 00	850 00	1,280 00	1,210 00	650 00	500 00
845 62	1,124 36	1,471 90	1,007 44	2,535 70	2,587 71	3,480 13	862 57	2,248 61

"f" 4 months' operation.

"p" 13 months' operation.

xa, xb, xh See page 68.

STATEMENT

Comparative Detailed Operative Reports of Electric Developments of Hydro

Municipality	Palmerston	Tilbury		Acton			
Population	1,843 xb	xa	1,740	xa	1,735		
—	1916	1915	1916	1913	1914	1915	1916
EARNINGS	y	k					
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	6,102 25	979 57	1,507 37	1,236 50	1,463 72	1,931 11	1,942 11
Commercial Light	*	1,476 53	2,071 77	1,567 48	1,496 18	1,725 73	1,592 62
Power	282 57	.....	149 60	318 77	836 13	1,019 27	1,565 53
Street Light	1,542 33	715 00	938 73	1,000 00	1,563 00	1,555 00	1,497 50
Miscellaneous .....	.....	19 39	12 85	286 72	83 60	188 76	136 31
Total	7,927 15	3,190 49	4,680 32	4,409 47	5,442 63	6,419 87	6,734 07
EXPENSES							
Power Purchased	1,480 74	1,601 33	2,267 40	1,801 50	2,344 50	2,495 70	2,500 20
Sub-Stn. Operation	1,133 63	.....	.....	.....	.....	.....	.....
“ “ Maint’ce. ....	.....	.....	.....	.....	.....	.....	.....
Dist. System, Operation and Maintenance	66 02	.....	12 09	371 97	35 42	78 52	63 88
Line Transformer M’t’ce. ....	.....	.....	.....	.....	.....	.....	.....
Meter Maintenance .....	.....	.....	.....	.....	.....	.....	.....
Consumers’ Premises—Exp. Street Light Sys., Opera- tion and Maintenance..	44 00	10 60	23 10	7 20	147 12	144 16	112 23
Promotion of Business ..	.....	.....	.....	.....	.....	.....	.....
Billing and Collecting ..	.....	.....	.....	.....	.....	.....	.....
Gen. Office, Sal. and Exp..	1,044 29	643 64	1,054 03	841 70	943 77	667 70	999 19
Undistributed Expenses ..	.....	.....	.....	.....	.....	.....	.....
Int. and Deb. Payments..	1,840 00	668 57	864 00	442 00	1,124 06	1,124 06	1,101 41
Total Expenses	5,608 68	2,924 14	4,220 62	3,584 37	4,594 87	4,510 14	4,776 91
Surplus	2,318 47	266 35	459 70	825 10	847 76	1,909 73	1,957 16
Loss .....	.....	.....	.....	.....	.....	.....	.....
Depreciation Charge .	295 00	.....	275 00	500 00	500 00	500 00	500 00
Surp. Less Depr. Chg.	2,023 47	266 35	184 70	325 10	347 76	1,409 73	1,457 16

* Domestic and Commercial not separable.

“k” 8 months’ operation.

“y” 5 months Hydro; 7 months steam.

xa, xb See page 68.

“C”—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Graven- hurst 1,702 xh	Mitchell 1,687				Durham 1,600 xb	Exeter 1,572 xh	Dresden xb 1,521	
1916	1913	1914	1915	1916	1916	1916	1915	1916
						h	k	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
3,553 06	2,424 59	2,470 29	2,379 58	2,311 80	1,518 72	727 88	1,093 68	1,995 51
4,575 10	2,813 92	2,712 55	2,684 01	2,677 35	1,057 33	677 73	1,223 25	1,986 21
2,469 19	6,160 53	3,944 91	2,333 08	3,231 56	.....	361 73	.....	.....
1,172 49	1,675 00	1,950 00	2,100 00	2,100 00	1,068 00	1,473 88	1,100 00	1,650 00
.....	385 50	443 90	63 20	9 74	.....	50 78	153 51	286 29
11,769 84	13,459 54	11,521 65	9,559 87	10,330 45	3,644 05	3,292 00	3,570 44	5,918 01
2,470 59	6,858 86	4,882 39	4,424 38	4,966 61	2,005 89	1,477 19	1,917 34	2,685 88
.....	12 35	.....	.....	.....	.....	.....	.....	.....
1,252 54	81 25	66 52	486 96	201 04	254 48	23 04	25 82	40 62
.....
50 72	44 64	34 12	26 10	38 40	43 50	21 65	11 24	124 30
.....
2,156 21	1,223 80	1,315 10	1,258 61	2,004 69	166 31	567 86	729 57	1,259 82
.....	100 00	.....	.....	.....	.....	.....	.....	.....
3,483 41	2,224 07	2,224 06	2,124 46	1,808 33	1,277 28	665 47	754 98	1,492 65
9,413 47	10,544 97	8,522 19	8,320 51	9,019 07	3,747 46	2,755 21	3,438 95	5,603 27
2,356 37	2,914 57	2,999 46	1,239 36	1,311 38	.....	536 79	131 49	314 74
.....	.....	.....	.....	.....	103 41	.....	.....	.....
1,650 00	1,150 00	1,200 00	1,000 00	1,000 00	.....	.....	.....	314 74
706 37	1,764 57	1,799 46	239 36	311 38	103 41	536 79	131 49	000 00

“h” 6 months’ operation.
“k” 8 months’ operation.
Italics denote losses.
xb, xh See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality	New Hamburg				Victoria Harbor		Blenheim
Population	1,543				1,477		1,424
—	xh				xh		xh
	1913	1914	1915	1916	1915	1916	1916
EARNINGS					e		
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	1,589 21	1,779 90	1,888 04	1,816 44	105 79	642 29	2,231 76
Commercial Light	1,890 72	1,403 56	1,273 38	1,211 25	117 85	1,171 37	2,356 37
Power	5,792 20	5,209 51	2,825 57	1,646 90			
Street Light	1,827 00	1,827 00	1,827 00	1,827 00	141 00	720 00	2,536 00
Miscellaneous	325 44		351 77	400 90			31 78
Total	11,424 57	10,219 97	8,165 76	6,902 49	364 64	2,533 66	7,155 91
EXPENSES							
Power Purchased	5,206 00	4,770 26	3,144 80	2,934 14	172 82	954 00	3,326 29
Sub-Stn. Operation							
“ “ Maint'ce.							
Dist. System, Operation and Maintenance	323 40	380 19	469 01	480 61	17 89	51 45	76 54
Line Transformer M't'c'e.							
Meter Maintenance							
Consumers' Premises—Exp.							
Street Light Sys., Operation and Maintenance ..			177 00	101 98		55 40	165 98
Promotion of Business ..							
Billing and Collecting ..							
Gen. Office, Sal. and Exp. ..	1,194 68	995 47	1,055 70	1,056 52	30 00	157 26	684 53
Undistributed Expenses ..		107 21					18 48
Int. and Deb. Payments ..	1,170 92	1,172 91	1,303 57	1,170 92		497 96	897 08
Total Expenses	7,895 00	7,426 04	6,150 08	5,744 17	220 71	1,716 07	5,168 90
Surplus	3,529 57	2,793 93	2,015 68	1,158 32	143 93	817 59	1,987 01
Loss							
Depreciation Charge ..	900 00	900 00	900 00	830 00		190 00	440 00
Surp. Less Depr. Chg. ..	2,629 57	1,893 93	1,115 68	328 32	143 93	627 59	1,547 01

“e” 3 months' operation.

xh See page 68.

“ C ”—Continued

Municipalities for the years ending 31st December, 1913, 1914, 1915 and 1916

Harriston	Port Dalhousie				Caledonia			
1,404 xb	xa	1,318			xh	1,217		
1916	1913	1914	1915	1916	1913	1914	1915	1916
y								
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
2,967 86	3,742 54	3,656 01	3,608 70	2,868 05	404 60	880 54	265 62	263 39
* 366 79	* 347 28	* 429 54	* 252 12	782 99	* 339 12	* 188 54	950 38	777 38
1,253 25	1,246 67	880 00	968 00	850 00	470 34	780 00	138 42	519 82
					584 00		808 00	760 00
4,587 90	5,336 49	4,965 55	4,828 82	4,840 16	1,458 94	1,849 08	2,162 42	2,320 59
1,191 50	2,393 00	2,407 20	2,415 28	1,911 14	766 70	669 00	793 00	917 00
1,026 97								
254 98	253 81	421 83	225 52	600 76	23 05	92 95	53 58	91 65
77 28	8 74	65 28	25 75	54 90		35 80	22 28	22 65
205 45	302 30	712 50	1,014 54	1,092 59	48 28	66 82	92 76	82 85
522 46	112 98	218 83						
992 61	814 89	725 89	629 04	1,264 89	134 47	122 86	361 72	361 72
4,271 25	4,785 72	4,551 53	4,310 13	4,924 28	972 50	987 43	1,343 34	1,475 87
316 65	550 77	414 02	518 69		486 44	861 65	819 08	844 72
				84 12				
345 00	450 00	414 02	415 00		250 00	260 00	300 00	260 00
28 35	100 77		103 69	84 12	236 44	601 65	519 08	584 72

* Domestic and Commercial not separable.
“ y ” 5 months Hydro; 7 months steam.
Italics denote losses.
xa, xb, xh See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Norwich xh 1,189				New Toronto xa 1,186	
	1913	1914	1915	1916	1914	1915
EARNINGS			†	†		
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	1,926 78	2,168 13	2,529 91	2,319 58	653 56	1,416 10
Commercial Light	1,162 98	995 16	1,075 79	1,168 34	*	*
Power	1,978 55	1,893 72	2,169 31	2,642 97	.....	2,140 36
Street Light	1,285 50	1,197 00	1,126 00	1,183 56	600 00	783 00
Miscellaneous	46 71	746 92	2,504 61	3,730 22	.....	.....
Total	6,400 52	7,000 93	9,405 62	11,044 67	1,253 56	4,339 46
EXPENSES						
Power Purchased	3,176 24	2,849 30	2,954 63	6,039 14	233 30	1,351 92
Sub-Stn. Operation .....	.....	.....	.....	.....	.....	.....
“ “ Maint'ce..	.....	.....	.....	.....	.....	.....
Dist. System, Operation and Maintenance	178 90	464 80	809 58	883 68	50 73	137 80
Line Transformer M't'c'e.	.....	13 48	7 05	116 70	.....	.....
Meter Maintenance.....	.....	37 11	1 32	1 35	.....	.....
Consumers' Premises—Exp.	.....	.....	.....	.....	.....	.....
Street Light Sys., Opera- tion and Maintenance..	79 51	95 40	75 95	88 14	137 85	55 00
Promotion of Business ..	.....	.....	.....	.....	.....	.....
Billing and Collecting ...	.....	.....	.....	.....	.....	.....
Gen. Office, Sal. and Exp..	838 27	534 15	595 76	574 16	318 01	629 49
Undistributed Expenses ..	.....	.....	.....	.....	.....	.....
Int. and Deb. Payments..	886 40	960 58	1,985 15	2,452 31	178 44	654 10
Total Expenses	5,159 32	4,954 82	6,429 44	10,155 48	918 33	2,828 31
Surplus	1,241 20	2,046 11	2,976 18	889 19	335 23	1,511 15
Loss .....	.....	.....	.....	.....	.....	.....
Depreciation Charge .	500 00	530 00	1,195 00	1,370 00	200 00	550 00
Surp. Less Depr. Chg.	741 20	1,516 11	1,781 18	480 81	135 23	961 15

* Domestic and Commercial not separable.

† Miscellaneous includes Rural Revenue.

xa, xh See page 68.

"C"—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

New Toronto 1,186 xa	Waterford xh 1,133		Shel- burne 1,115 xa	Elora xh 1,115			Beaverton xh 1,015		Markdale 989 xa
1916	1915	1916	1916	1914	1915	1916	1915	1916	1916
			g	c			q		l
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1,571 03	685 22	1,112 28	538 29	101 98	1,044 49	1,253 03	1,484 62	1,417 39	934 65
143 32	546 08	796 50	494 38	167 25	1,820 07	1,828 25	1,149 67	1,065 23	972 28
9,744 31	.....	1,007 74	.....	.....	197 78	972 12	456 74	383 45	35 76
838 00	892 50	1,174 82	446 23	110 33	1,000 00	1,000 00	1,057 72	923 04	540 46
.....	.....	.....	.....	.....	214 97	7 86	109 08	62 20	252 79
12,296 66	2,123 80	4,091 34	1,478 90	379 56	4,277 31	5,061 26	4,257 83	3,851 31	2,735 94
6,547 34	931 11	2,063 38	650 50	133 05	1,711 73	2,004 97	3,138 00	3,423 94	1,039 68
.....
228 19	26 30	212 03	.....	.....	274 00	85 28	83 17	107 54	80 13
.....
83 02	23 16	90 00	.....	24 78	61 52	53 80	.....	32 22	43 09
.....
678 32	78 41	184 20	238 33	66 19	785 52	817 85	152 02	432 41	288 23
922 31	978 56	1,366 37	34 33	125 35	846 15	875 17	884 64	855 20	657 86
8,459 18	2,037 54	3,915 98	923 16	349 37	3,678 92	3,837 07	4,257 83	3,851 31	2,108 99
3,837 48	86 26	175 36	555 74	30 19	598 39	1,224 19	.....	.....	626 95
.....
450 00	.....	.....	.....	.....	460 00	375 00	.....	.....	.....
3,387 48	86 26	175 36	555 74	30 19	138 39	849 19	.....	.....	626 95

"c"—1 month's operation.

"g"—5 months' operation.

"l"—9 months' operation.

"q"—14 months' operation.

xa, xh See page 68.

STATEMENT

Comparative Detailed Operative Reports of Electric Departments of Hydro

Municipality Population	Hagersville 1,105				Winchester 1,065		
	1913	1914	1915	1916	1914	1915	1916
EARNINGS	e						
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	81 42	1,222 33	1,172 85	1,606 80	2,972 09	1,698 40	1,812 29
Commercial Light	*	*	1,592 59	1,343 82	*	1,336 85	1,364 47
Power	746 85	2,679 08	2,434 62	2,527 92			227 52
Street Light	300 00	1,200 00	1,200 00	1,200 00	1,500 00	1,500 00	1,500 00
Miscellaneous							39 36
Total	1,128 27	5,101 41	6,400 06	6,678 54	4,472 09	4,535 25	4,943 64
EXPENSES							
Power Purchased	967 23	3,084 34	3,010 99	3,163 30	1,827 07	2,137 86	2,337 50
Sub-Stn. Operation							
“ “ Maint'ce.							
Dist. System, Operation and Maintenance		52 15	156 80	65 66	2 32	501 85	156 00
Line Transformer M't'c'e.							
Meter Maintenance							
Consumers' Premises—Exp.							
Street Light Sys., Opera- tion and Maintenance.		73 00	58 37		58 50	60 26	35 28
Promotion of Business ..							
Billing and Collecting ..							
Gen. Office, Sal. and Exp..	37 69	545 77	595 22	748 01	173 09	380 55	714 53
Undistributed Expenses ..							
Int. and Deb. Payments..	97 60	383 93	577 57	550 80	541 80	795 91	773 70
Total Expenses	1,102 52	4,139 19	4,398 94	4,527 77	2,602 78	3,876 43	4,017 01
Surplus	25 75	962 22	2,001 12	2,150 77	1,869 31	658 82	926 63
Loss							
Depreciation Charge ..		425 00	500 00	380 00	500 00	465 00	370 00
Surp. Less Depr. Chg.	25 75	537 22	1,501 12	1,770 77	1,369 31	193 82	556 63

* Domestic and Commercial not separable.

“e” 3 months' operation.

xa, xh See page 68.

“ C ”—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Port Credit				Stayner				Cannington	
1,046				972				903	
1913	1914	1915	1916	1913	1914	1915	1916	1915	1916
				d				q	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
1,963 22	2,461 42	1,975 29	1,781 49	158 48	909 58	995 47	1,012 15	1,599 40	1,720 25
*	*	587 11	464 02	116 91	747 93	933 55	997 39	1,120 04	973 63
848 59	308 88	236 47	257 40	301 86	1,699 08	1,694 94	1,835 29	464 26	462 47
696 00	810 60	1,000 00	1,033 00	35 00	707 50	607 25	609 00	980 12	831 96
.....	.....	.....	.....	.....	.....	.....	.....	22 58	.....
3,507,81	3,580 90	3,798 87	3,535 91	612 25	4,064 09	4,231 21	4,453 83	4,186 40	3,988 31
1,210 65	1,333 00	1,406 46	1,546 06	187 52	2,726 45	2,524 18	2,725 01	2,693 38	2,316 44
.....
22 21	23 51	77 77	386 30	.....	56 85	67 53	155 26	251 70	.....
.....
121 27	72 77	22 29	44 40	.....	96 00	53 78	.....	11 04	33 72
.....
171 82	450 67	470 75	214 04	14 48	31 00	98 02	358 14	223 48	690 83
.....	18 46	.....	.....	.....	.....	.....	.....	.....	48 80
534 23	571 55	537 22	568 95	340 82	784 66	784 66	753 16	1,006 80	898 52
2,060 18	2,469 96	2,514 49	2,759 75	542 82	3,694 96	3,528 17	3,991 57	4,186 40	3,988 31
1,447 63	1,110 94	1,284 38	776 16	69 43	369 13	703 04	462 26	.....	.....
.....
446 00	535 00	600 00	470 00	.....	115 00	300 00	280 00	.....	.....
1,001 63	575 94	684 38	306 16	69 43	254 13	403 04	182 26	.....	.....

* Domestic and Commercial not separable.
“ d ” 2 months' operation.
“ q ” 14 months' operation.
xa, xh See page 68.

STATEMENT

Comparative Detailed Operative Reports of Electric Departments of Hydro

Municipality Population	Dutton xa 870		Pt. Stanley xa 849				Milverton 890 xh
—	1915	1916	1913	1914	1915	1916	1916
EARNINGS	e						
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	318 85	1,353 04	1,828 66	2,066 41	2,498 57	2,956 97	292 00
Commercial Light	206 59	960 27	1,771 70	1,753 60	1,736 42	1,551 37	406 95
Power		135 31	2,418 00	2,170 88	2,064 76	1,985 92	.....
Street Light	364 23	1,469 88	2,199 50	1,961 35	1,900 50	1,714 00	665 98
Miscellaneous		111 39	.....	157 77	226 18	214 00	.....
Total	889 67	4,029 89	8,217 86	8,110 01	8,426 43	8,422 26	1,364 93
EXPENSES							
Power Purchased	442 18	1,813 70	3,506 43	3,682 26	4,735 96	4,753 04	593 81
Sub-Stn. Operation .....							.....
" " Maint'ce..							.....
Dist. System, Operation and Maintenance	15 55	22 35	354 49	116 92	65 01	97 43	4 98
Line Transformer M't'c'e. ....							.....
Meter Maintenance.....							.....
Consumers' Premises—Exp.							.....
Street Light Sys., Opera- tion and Maintenance..	12 04	69 91	.....	.....	63 13	191 12	33 48
Promotion of Business ..			292 81	286 23			.....
Billing and Collecting ..			368 47	581 96	919 21	940 24	8 08
Gen. Office, Sal. and Exp..	79 30	204 36					.....
Undistributed Expenses ..							.....
Int. and Deb. Payments..	144 70	476 04	1,188 91	1,232 82	1,232 82	1,232 82	690 86
Total Expenses	693 77	2,586 36	5,711 11	5,900 19	7,016 13	7,214 65	1,331 21
Surplus	195 90	1,443 53	2,506 75	2,209 82	1,410 30	1,207 61	33 72
Loss .....							.....
Depreciation Charge .		240 00	617 75	950 00	740 00	665 00	.....
Surp. Less Depr. Chg.	195 90	1,203 53	1,889 00	1,259 82	670 30	542 61	33 72

"e" 3 months' operation.
xa, xh See page 68.

“C”—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

xh Chesterville 854			xa Ayr 800		xh Waterdown 785			
1914	1915	1916	1915	1916	1913	1914	1915	1916
			n				†	†
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
530 13	919 27	1,490 99	892 63	1,084 46	1,164 29	1,054 13	1,202 41	1,218 86
791 67	1,187 54	1,240 56	773 08	804 00	*	535 83	567 65	575 10
.....	.....	177 55	348 78	393 39	917 63	1,011 38	1,207 80	1,149 78
465 00	689 00	798 00	1,091 33	1,092 00	435 00	510 00	580 80	590 00
.....	.....	.....	.....	.....	.....	418 46	1,488 36	1,681 41
1,786 80	2,795 81	3,707 10	3,105 82	3,373 85	2,516 94	3,529 80	5,046 22	5,215 15
1,107 66	2,123 30	1,993 63	1,170 61	1,320 35	988 00	1,660 71	1,605 10	2,003 34
.....
.....	126 30	336 99	.....	.....	183 71	67 66	281 36	354 12
.....
.....	.....	48 29	45 20	44 52	35 31	48 15	17 00	41 10
.....
59 00	56 77	120 00	397 82	301 98	213 14	207 87	327 69	592 97
.....	.....	.....	.....	115 74	.....	.....	.....	.....
344 00	572 55	435 34	1,119 49	1,076 82	521 56	723 09	1,243 23	1,482 95
1,510 66	2,878 92	2,934 25	2,733 12	2,859 41	1,941 72	2,707 48	3,474 38	4,274 48
276 14	.....	772 85	372 70	514 44	575 22	822 32	1,571 84	940 67
.....	83 11	.....	.....	.....	.....	.....	.....	.....
247 50	.....	375 00	250 00	260 00	365 00	420 00	1,000 00	887 00
28 64	83 11	397 85	122 70	254 44	210 22	402 32	571 84	53 67

* Domestic and Commercial not separable.
† Miscellaneous includes Rural Revenue.
“n” 11 months’ operation.
Italics denote losses.
xa, xh See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Thamesville xh 769		Bolton xh 727		Dundalk 721 xh	Bothwell xh 703	
—	1915	1916	1915	1916	1916	1915	1916
EARNINGS	e		m			e	
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	378 79	1,729 79	624 86	926 86	924 30	230 61	928 16
Commercial Light	283 86	1,021 17	553 80	882 26	960 58	191 21	768 59
Power			313 74	3,947 32	618 52		
Street Light	255 00	1,030 00	811 25	893 75	744 00	219 25	1,186 06
Miscellaneous		25 42		186 00			
Total	917 65	3,806 38	2,303 65	6,836 19	3,247 40	641 07	2,882 81
EXPENSES							
Power Purchased	537 22	1,872 33	1,126 94	4,120 46	1,362 22	440 00	1,604 92
Sub-Stn. Operation							
“ “ Maint'ce.							
Dist. System, Operation and Maintenance	4 15	22 40	206 57	30 82	30 00		15 45
Line Transformer M't'c'e.							
Meter Maintenance							
Consumers' Premises—Exp. Street Light Sys., Opera- tion and Maintenance.	40 00	20	12 12	77 61		36 72	11 16
Promotion of Business ..							
Billing and Collecting ..							
Gen. Office, Sal. and Exp.	116 00	262 83	314 26	289 94	158 80	4 80	114 77
Undistributed Expenses ..							
Int. and Deb. Payments ..		740 65	552 32	866 16	818 56		565 99
Total Expenses	697 37	2,898 41	2,212 21	5,384 99	2,369 58	481 52	2,312 29
Surplus	220 28	907 97	91 44	1,441 20	877 82	159 55	570 52
Loss							
Depreciation Charge ..		190 06		321 00	200 00		135 00
Surp. Less Depr. Chg.	220 28	717 97	91 44	1,120 20	677 82	159 55	435 52

“e” 3 months' operation.

“m” 10 months' operation.

xh See page 68.

"C"—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Lucan xh 662		Woodbridge xh 639		Ailsa Craig 586 xa	Creemore xh 585			Embro xa 483	
1915	1916	1915	1916	1916	1914	1915	1916	1915	1916
n				n	d			n	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
824 07	1,124 73	367 49	507 10	579 57	97 31	699 81	922 41	400 50	633 95
687 37	857 11	443 53	556 82	213 46	127 31	937 84	1,041 90	489 67	598 41
18 66	159 67	498 44	2,221 33	15 57	39 60	939 20	1,151 96	.....	155 54
812 60	979 50	960 00	963 00	819 62	138 80	857 28	874 58	620 68	685 10
108 10	135 55	.....	.....	.....	.....	1 35	6 00	.....	58 25
2,450 80	3,256 56	2,269 46	4,248 25	1,628 22	403 02	3,435 48	3,996 85	1,510 85	2,131 25
1,511 32	1,543 95	877 63	2,461 11	746 02	162 00	2,580 53	2,252 69	782 02	1,057 98
.....
.....	66 30	66 65	44 81	30 56	.....	185 17	182 00	16 00	16 40
.....
.....	14 50	24 96	48 79	16 74	.....	14 80	22 20	36 28	94 61
.....
440 03	254 59	153 75	284 01	100 07	6 14	221 98	257 16	95 98	74 71
412 43	873 49	239 38	636 88	401 10	20 59	509 55	689 52	285 25	390 30
2,363 78	2,752 83	1,362 37	3,475 60	1,294 49	188 73	3,512 03	3,403 57	1,215 53	1,634 00
87 02	503 73	907 09	772 65	333 73	214 29	.....	593 28	295 32	497 25
.....	.....	.....	.....	.....	.....	76 55	.....	.....	.....
.....	270 00	425 00	300 00	180 00	.....	.....	200 00	250 00	235 00
87 02	233 73	482 09	472 65	153 73	214 29	76 55	303 28	45 32	262 25

"d" 2 months' operation.
 "n" 11 months' operation.
 Italics denote losses.
 xa, xh See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Coldwater				Wyoming	Flesherton
	xh	579			544 xh	428 xh
	1913	1914	1915	1916	1916	1916
EARNINGS					d	
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	735 68	853 56	874 94	977 62	96 84	568 76
Commercial Light	*	589 85	703 35	848 82	85 38	423 83
Power	247 19	617 26	363 88	247 91	.....	.....
Street Light	532 00	528 00	528 00	528 00	128 00	504 00
Miscellaneous .....	.....	.....	.....	.....	.....	.....
Total	1,514 87	2,588 67	2,470 17	2,602 35	310 22	1,496 59
EXPENSES						
Power Purchased	535 86	897 12	1,018 75	1,008 22	72 52	809 49
Sub-Stn. Operation .....	.....	.....	.....	.....	.....	.....
“ “ Maint'ce. ....	.....	.....	.....	.....	.....	.....
Dist. System, Operation and Maintenance	74 58	139 37	138 72	147 60	.....	.....
Line Transformer M't'c'e. ....	.....	.....	.....	.....	.....	.....
Meter Maintenance.....	.....	.....	.....	.....	.....	.....
Consumers' Premises-Exp. ....	.....	.....	.....	.....	.....	.....
Street Light Sys., Opera- tion and Maintenance..	32 92	32 00	20 00	22 32	22 32	22 32
Promotion of Business ..	.....	.....	.....	.....	.....	.....
Billing and Collecting ...	.....	.....	.....	.....	.....	.....
Gen. Office, Sal. and Exp..	1 50	68 00	80 00	100 00	21 48	185 46
Undistributed Expenses ..	.....	.....	300 00	226 90	.....	.....
Int. and Deb. Payments..	.....	481 64	481 64	481 64	103 04	85 34
Total Expenses	644 86	1,618 13	2,039 11	1,986 68	219 36	1,102 61
Surplus	870 01	970 54	431 06	615 67	90 86	393 98
Loss .....	.....	.....	.....	.....	.....	.....
Depreciation Charge .	375 00	380 00	380 00	325 00	.....	150 00
Surp. Less Depr. Chg.	495 01	590 54	51 06	290 67	90 86	243 98

* Domestic and Commercial not separable.

“d” 2 months' operation.

xh See page 68.

“C”—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Woodville xh 388		Chats- worth 374 xh	Baden xh				Breachin xh	
1915	1916	1916	1913	1914	1915	1916	1915	1916
q		n						
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
324 34	496 52	287 52	884 11	1,247 81	938 33	808 21	148 83	172 42
563 68	512 07	193 15	*	*	*	*	407 78	404 70
1,149 17	1,185 54	391 98	2,242 77	4,580 23	4,588 87	5,059 22	1,007 59	1,153 32
507 60	423 44	325 00	830 95	705 68	580 06	683 58	117 00	117 00
.....	.....	77 65	.....	.....	.....	.....	.....	150 00
2,544 89	2,617 57	1,275 30	3,957 83	6,533 72	6,107 26	6,551 01	1,681 20	1,997 44
.....
2,167 90	1,970 18	727 65	2,807 04	4,541 56	4,153 75	5,080 81	1,498 18	1,673 64
.....
.....
12 00	8 55	62 20	28 84	179 28	52 26	48 36	.....	.....
.....
.....
.....
26 64	11 04	2 50	.....	14 52	43 53	11 04	.....	.....
.....
.....
42 87	297 34	91 78	267 45	389 45	357 10	321 95	86 22	152 71
.....
295 48	330 46	310 81	325 26	325 26	373 71	325 28	96 80	171 09
.....
2,544 89	2,617 57	1,194 94	3,428 59	5,450 07	4,980 35	5,787 44	1,681 20	1,997 44
.....	.....	80 36	529 24	1,083 65	1,126 91	763 57	.....	.....
.....
.....
.....	.....	.....	277 00	280 00	300 00	275 00	.....	.....
.....
.....	.....	80 36	252 24	803 65	826 91	488 57	.....	.....

* Domestic and Commercial not separable.
“n” 11 months’ operation.
“q” 14 months’ operation.
xh See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Beachville xh				Burford xh	
	1913	1914	1915	1916	1915	1916
EARNINGS	s				h	
	\$ c.	\$ c.	\$ c.	\$ c.	\$ e.	\$ c.
Domestic Light	562 37	587 33	363 33	400 81	176 14	577 69
Commercial Light	*	*	296 37	263 62	111 81	380 44
Power	5,993 81	5,368 04	5,593 15	5,393 02	235 76	519 72
Street Light	206 03	150 00	150 00	150 00	279 48	572 00
Miscellaneous						
Total	6,762 21	6,105 37	6,402 85	6,207 45	803 19	2,049 85
EXPENSES						
Power Purchased	4,221 68	3,283 89	4,522 88	5,352 36	571 55	1,129 67
Sub-Stn. Operation						
" " Maint'ce..						
Dist. System, Operation						
and Maintenance	54 34	34 85	27 76	56 33		25 84
Line Transformer M't'ce.						
Meter Maintenance.....						
Consumers' Premises-Exp.						
Street Light Sys., Opera-						
tion and Maintenance..	76 37	44 46	9 95	35 88		12 94
Promotion of Business ..						
Billing and Collecting ...						
Gen. Office, Sal. and Exp..	249 50	193 11	258 66	325 81	77 06	71 43
Undistributed Expenses ..	127 62	29 18		38 36		59 48
Int. and Deb. Payments..	288 88	501 45	357 79	369 82	201 21	413 25
Total Expenses	5,018 39	4,086 40	5,177 04	6,178 56	849 82	1,712 61
Surplus	1,743 82	2,018 97	1,225 81	28 89		337 24
Loss					46 63	
Depreciation Charge .	525 00	400 00	420 00	375 00		165 00
Surp. Less Depr. Chg.	1,218 82	1,618 97	805 81	34 11	46 63	172 24

* Domestic and Commercial not separable.

"h" 6 months' operation.

"s" 2 years' operation.

Italics denote losses.

xh See page 68.

“ C ”—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Comber xh		Drumbo xh		Delaware xh		Dorchester xh		Granton xh	Gran- tham Twp. xh
1915	1916	1915	1916	1915	1916	1915	1916	1916	1916
j				m					†
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
214 87	538 57	304 39	340 75	146 16	354 60	579 23	613 03	180 84	3,030 72
274 49	678 58	288 99	277 43	114 18	141 64	309 88	275 82	70 90	.....
.....	.....	159 85	116 57	.....	.....	287 95	667 93	.....	.....
448 37	779 51	455 00	420 00	188 18	241 50	85 72	326 74	240 01	.....
.....
937 73	1,996 66	1,208 23	1,154 75	448 52	737 74	1,262 78	1,883 52	491 75	3,030 72
.....
620 24	1,159 98	795 36	602 85	217 11	352 26	583 47	785 60	248 72	668 09
.....
.....	38 38	.....	3 35	.....	7 87	.....	33 19	8 32	471 33
.....
.....	40 94	.....	11 04	.....	34 20	.....	22 77	2 40	.....
.....	.....	.....	.....	.....	.....	.....	.....	17 80	474 86
135 76	137 15	51 29	54 64	71 89	45 63	58 54	102 37	.....	.....
.....	50 40	.....	.....	.....	.....	.....	.....	.....	.....
172 92	378 26	281 33	271 11	77 13	229 35	159 47	281 55	108 53	2,997 93
.....
928 92	1,805 11	1,127 98	942 99	366 13	669 31	801 48	1,225 48	385 77	4,612 21
8 81	191 55	80 25	211 76	82 39	68 43	461 30	658 04	105 98	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	1,581 49
.....	145 00	.....	110 00	.....	80 00	200 00	150 00	.....	.....
8 81	46 55	80 25	101 76	82 39	11 57	261 30	508 04	105 98	1,581 49

† Domestic includes Rural Revenue.
“ j ” 7 months' operation.
“ m ” 10 months' operation.
Italics denote losses.
xh See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Elmvale				Holstein	Lambeth
	xh				xh	xh
—	1913	1914	1915	1916	1916	1915
EARNINGS	h				j	l
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	284 34	673 18	704 12	816 74	141 80	344 47
Commercial Light	358 60	896 11	778 93	736 74	169 63	119 00
Power		438 38	1,186 44	1,043 96		455 90
Street Light	302 00	624 00	624 00	624 00	124 00	295 16
Miscellaneous						
Total	944 94	2,631 67	3,293 49	3,221 44	435 43	1,214 53
EXPENSES						
Power Purchased	506 33	898 78	1,335 80	1,352 32	213 51	800 72
Sub-stn. Operation						
“ “ Maint'ce.						
Dist. System, Operation and Maintenance	7 86	326 94	300 00	300 00	12 17	20 10
Line Transformer M't'ce.						
Meter Maintenance						
Consumers' Premises—Exp.						
Street Light Sys., Opera- tion and Maintenance			15 17	56 28	75	
Promotion of Business						
Billing and Collecting						
Gen. Office, Sal. and Exp.	75 12	434 67	213 27	147 24	37 56	44 71
Undistributed Expenses						
Int. and Deb. Payments	449 76	434 67	546 42	498 83	229 17	156 10
Total Expenses	1,039 07	2,108 42	2,410 66	2,354 67	493 16	1,021 63
Surplus		523 25	882 83	866 77		192 90
Loss	94 13				57 73	
Depreciation Charge		350 00	385 00	290 00		
Surp. Less Depr. Chg.	94 13	173 25	497 83	576 77	57 73	192 90

“ h ” 6 months' operation.

“ j ” 7 months' operation.

“ l ” 9 months' operation.

Italics denote losses.

xh See page 68.

“ C ”—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Lambeth	Lynden		Mount Brydges		Otterville	Plattsville		Princeton	
xh	xh		xh		xh	xh		xh	
1916	1915	1916	1915	1916	1916	1915	1916	1915	1916
	d		l		m			n	
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
575 65	60 00	254 76	427 45	644 75	476 40	551 39	666 30	440 42	657 80
208 96	28 94	227 57	*	170 46	111 14	477 71	580 62	71 57	127 81
249 36	.....	650 38	517 50	760 58	22 50	1,128 27	1,436 62	.....	192 92
420 00	67 50	360 00	449 66	532 00	269 15	498 00	534 00	340 00	340 00
.....	.....	.....	.....	.....	.....	.....	.....	.....	6 61
1,453 97	156 44	1,492 71	1,394 61	2,107 79	879 19	2,655 37	3,217 54	851 99	1,325 14
.....
819 20	55 95	920 13	1,025 71	1,308 69	429 36	2,031 19	2,079 85	507 23	919 15
.....
3 09	.....	23 89	22 05	12 57	3 15	.....	49 30	.....	9 90
.....
70 99	.....	24 54	.....	28 00	11 04	14 02	19 49	.....	15 93
.....
58 32	.....	70 10	117 38	79 10	74 29	85 42	86 58	11 84	132 49
.....	.....	.....	.....	51 09	.....	.....	.....	.....	.....
382 49	.....	315 32	358 60	296 20	346 74	386 29	346 17	263 35	239 57
1,334 09	55 95	1,353 98	1,523 74	1,775 65	864 58	2,516 92	2,581 39	782 42	1,317 04
119 88	100 49	138 73	.....	332 14	14 61	138 45	636 15	69 57	8 10
.....	.....	.....	129 13	.....	.....	.....	.....	.....	.....
100 00	.....	120 00	.....	125 00	.....	.....	145 00	.....	96 00
19 88	100 49	18 73	129 13	207 14	14 61	138 45	491 15	69 57	87 00
.....

* Domestic and Commercial not separable
“ d ” 2 months' operation.
“ l ” 9 months' operation.
“ m ” 10 months' operation.
“ n ” 11 months' operation.
Italics denote losses.
xh See page 68.

STATEMENT

Comparative Detailed Operating Reports of Electric Departments of Hydro

Municipality Population	Port McNicol xh		Rockwood xh				Sunder- land xh
	1915	1916	1913	1914	1915	1916	1915
	n		f				q
EARNINGS	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	415 03	618 82	230 27	848 55	731 97	733 66	794 83
Commercial Light	311 20	301 92	*	*	251 27	388 05	939 85
Power		7 37	480 82	1,542 01	907 57	903 57	.....
Street Light	351 00	336 00	196 00	549 50	507 50	506 00	323 82
Miscellaneous							20 08
Total	1,077 23	1,264 11	907 09	2,940 06	2,398 31	2,531 28	2,078 58
EXPENSES							
Power Purchased	616 27	670 51	237 50	1,113 49	1,154 85	870 81	1,621 28
Sub-stn. Operation							
“ “ Maint’ce..							
Dist. System, Operation and Maintenance	18 88	99 30				36 26	.....
Line Transformer M’t’c’e.							
Meter Maintenance.....							
Consumers’ Premises—Exp.							
Street Light Sys., Opera- tion and Maintenance..	24 24	33 48	.....	36 14	13 92	46 97	24 96
Promotion of Business ...							
Billing and Collecting ...							
Gen. Office, Sal. and Exp..	164 58	169 56	44 46	119 55	115 74	111 49	33 27
Undistributed Expenses ..							
Int. and Deb. Payments..	203 14	482 51	357 49	413 19	445 80	395 77	399 07
Total Expenses	1,027 11	1,455 36	639 45	1,682 37	1,730 31	1,461 30	2,078 58
Surplus	50 12	.....	267 64	1,257 69	668 00	1,069 98	.....
Loss		191 25					
Depreciation Charge ..		130 00	.....	275 00	300 00	240 00	.....
Surp. Less Depr. Chg.	50 12	321 25	267 64	982 69	368 00	829 98	.....

* Domestic and Commercial not separable.
“f” 4 months’ operation.
“n” 11 months’ operation.
“q” 14 months’ operation.
Italics denote losses.
xh See page 63.

"C"—Continued

Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Sunderland	St. George		Stanford Twp.	Thorndale			Thamesford		
xh	xh		xh	xh			xh		
1916	1915	1916	1916	1914	1915	1916	1914	1915	1916
	f		f	m			m		
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
752 64	203 23	832 23	730 57	446 27	299 37	328 67	393 49	574 34	642 21
840 22	139 16	474 38	†	*	374 09	403 01	323 92	481 78	537 42
211 86	311 30	583 52	4,331 96	329 27	542 53	459 79	946 32	423 21	268 23
272 16	202 50	495 00	.....	294 00	294 00	294 46	372 16	469 00	476 00
.....
2,076 88	856 19	2,385 13	5,062 53	1,069 54	1,509 99	1,485 93	2,035 89	1,948 33	1,923 86
.....
1,345 62	411 15	1,227 88	2,009 48	510 00	883 86	1,139 22	1,031 10	993 40	1,013 59
.....
.....	.....	1 20	55 03	5 25	71 52	74 42	9 80	7 19	2 50
.....
22 32	.....	3 00	.....	29 04	7 19	65 18	23 68	27 47	33 90
.....
309 87	64 30	126 49	900 44	94 12	64 63	104 58	125 94	159 32	122 89
.....	.....	.....	.....	.....	.....	.....	.....	.....	48 84
399 07	172 00	412 83	737 19	109 92	11 74	205 60	249 94	209 41	477 08
.....
2,076 88	647 45	1,771 40	3,702 14	748 33	1,138 94	1,589 00	1,440 46	1,396 79	1,698 80
.....	208 74	613 73	1,360 39	321 21	371 05	.....	595 43	551 54	225 06
.....	.....	.....	.....	.....	.....	103 07	.....	.....	.....
.....	.....	150 00	.....	130 00	135 00	85 00	250 00	250 00	235 00
.....	208 74	463 73	1,360 39	191 21	236 05	188 07	345 43	301 54	9 94

* Domestic and Commercial not separable.

† Revenue all Rural.

"f" 4 months' operation.

"m" 10 months' operation.

Italics denote losses.

xh See page 68.

STATEMENT "C"—Concluded

Comparative Detailed Operative Reports of Electric Departments of Hydro Municipalities for the years ending December 31st, 1913, 1914, 1915 and 1916

Municipality	Toronto Township			Williamsburg		Waubauskene	
Population	xh			xh		xh	
—	1914	1915	1916	1915	1916	1915	1916
EARNINGS	r					n	
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Domestic Light	8,151 12	8,615 27	8,369 78	403 72	568 66	516 34	646 58
Commercial Light				139 26	224 29	220 50	496 47
Power					285 73	32 28	49 52
Street Light				156 00	220 67	377 00	348 00
Miscellaneous							
Total	8,151 12	8,615 27	8,369 78	698 98	1,299 35	1,146 12	1,540 57
EXPENSES							
Power Purchased	3,085 55	2,153 94	2,174 17	318 62	547 82	560 77	642 81
Sub-stn. Operation							
“ “ Maint'ce.							
Dist. System, Operation and Maintenance	284 02	706 20	395 59	82 50	97 63	16 55	110 16
Line Transformer M't'ce.							
Meter Maintenance							
Consumers' Premises—Exp.							
Street Light Sys., Operation and Maintenance					16 04		17 38
Promotion of Business							
Billing and Collecting							
Gen. Office, Sal. and Exp.	374 61	376 04	462 21	30 02	41 60	175 55	112 77
Undistributed Expenses							
Int. and Deb. Payments	1,358 65	3,482 49	3,253 87	211 27	220 67	220 84	425 56
Total Expenses	5,102 83	6,718 67	6,285 84	642 41	923 76	973 21	1,308 68
Surplus	3,048 29	1,896 60	2,083 94	56 57	375 59	172 91	231 89
Loss							
Depreciation Charge		1,800 00	1,934 00		70 00		115 00
Surp. Less Depr. Chg.	3,048 29	96 60	149 94	56 57	305 59	172 91	116 89

“n” 11 months' operation.

“r” 17 months' operation.

xh See page 68.

COMPARATIVE STATEMENT

OF

REVENUE, NUMBER OF CONSUMERS, TOTAL CONSUMPTION,
AVERAGE MONTHLY CONSUMPTION PER CONSUMER,
AVERAGE MONTHLY BILL AND NET COST PER
KW-HR. FOR YEARS 1912, 1913, 1914,
1915 AND 1916

STATEMENT "D"

Showing Comparative Revenue, Number of Customers, Total Kw-hr. Consumption, Average Monthly Consumption per Customer, Average Monthly Bill, and Net Cost per Kw-hr. for the Years 1912, 1913, 1914, 1915 and 1916

Municipality	Year	Domestic Light						Commercial Light						Power				
		Revenue	Consumption	Number of Consumers	Avg Monthly Consumption	Average Monthly Bill	Net Cost per Kw-hr.	Net Cost prior to Hydro	Revenue	Consumption	Number of Consumers	Avg Monthly Consumption	Average Monthly Bill	Net Cost per Kw-hr.	Net Cost prior to Hydro	Revenue	Number of Consumers	Total Number Consumers
Toronto.....	{ 1912	201,554 74	.....	11,441	.....	.....	.....	8 + 25	233,799 04	6,156,073	4,764	.....	4 09	.....	12 + 25	225,451 55	518	11,959
	{ 1913	190,376 89	4,220,270 16	5,519	25	1 25	4.4	.....	305,534 31	7,683,589	6,276	116	4 01	3.8	.....	347,708 88	1,037	22,320
	{ 1914	289,645 45	6,240,882 23	181	27	1 22	4.5	.....	291,907 92	10,243,496	7,227	126	3 60	3.9	.....	483,681 15	1,494	30,951
	{ 1915	331,807 18	8,599,559 29	724	27	1 04	3.9	.....	272,243 06	11,491,577	7,406	131	3 10	2.8	.....	575,239 17	1,504	38,455
	{ 1916	335,181 19	11,250,291 34	347	29	89	3.1	.....	25,453 99	628,471	924	.....	.....	2.4	.....	612,918 32	1,707	43,460
Hamilton	{ 1913	34,451 95	862,937	5,117	.....	.....	3.9	8 + 25	35,125 57	1,309,863	1,375	95	2 55	3.4	.....	47,415 58	209	6,250
	{ 1914	74,668 38	1,856,627	8,404	23	92	4	.....	34,633 16	1,840,920	1,434	109	2 06	1.9	.....	70,665 43	337	10,116
	{ 1915	92,207 60	2,514,104 10	595	23	81	3.7	.....	36,126 03	2,085,601	1,546	116	2 02	1.8	.....	84,789 71	406	12,435
	{ 1916	108,137 22	3,625,059 12	423	26	78	3	.....	51,365 91	.....	440	.....	.....	.....	7 + 8	115,224 78	464	14,433
Ottawa	{ 1912	62,598 18	.....	5,390	.....	.....	.....	7 + 8	53,438 04	.....	818	.....	7 08	.....	.....	25,299 94	90	5,920
	{ 1913	68,032 27	.....	5,766	.....	1 02	.....	.....	51,769 72	1,061,263	852	106	5 16	4.9	.....	26,978 76	152	6,736
	{ 1914	68,767 48	1,376,353	6,342	19	95	5	.....	46,636 99	1,501,978	1,060	131	4 07	3.1	.....	31,748 23	156	7,350
	{ 1915	67,441 19	1,767,519	7,338	22	82	3.8	.....	42,569 96	1,786,603	1,107	137	3 27	2.4	.....	32,126 50	140	8,538
	{ 1916	72,875 12	2,131,307	7,912	23	80	3.4	.....	28,527 44	.....	792	.....	.....	.....	9 + 25	42,996 39	188	9,207
London	{ 1912	28,196 62	.....	3,851	.....	.....	.....	9 + 25	39,256 07	1,350,000	1,007	125	3 63	3.0	.....	52,633 00	158	4,801
	{ 1913	41,932 42	920,000	5,201	17	77	4.5	.....	47,593 44	1,580,000	1,075	127	3 81	3	.....	79,758 96	198	5,406
	{ 1914	57,473 08	1,192,000	6,299	18	83	4.8	.....	43,751 37	1,452,896	1,046	137	3 44	3	.....	130,936 35	249	7,649
	{ 1915	57,184 75	1,732,435	7,326	21	70	3.3	.....	48,747 74	1,930,269	1,129	147	.....	2.5	.....	148,567 23	271	8,643
Brantford.....	{ 1916	71,146 90	2,378,144	8,282	25	76	2.9	.....	5,392 87	166,469	300	.....	.....	3.6	8 + 13	180,204 33	295	9,706
	{ 1914	7,103 77	148,427	1,184	.....	.....	4.8	8 + 13	10,746 67	347,349	321	94	2 89	3.1	.....	647 69	11	1,495
	{ 1915	13,629 36	319,439	1,615	19	82	4.3	.....	10,530 19	419,933	334	107	2 68	2.5	.....	12,901 29	18	1,954
	{ 1916	17,504 44	468,324	2,056	21	79	3.7	.....	12,009 99	309,757	377	82	3 16	3.9	.....	24,213 00	26	2,316
Windsor.....	{ 1914	3,143 41	.....	1,802	.....	.....	.....	12	1,107 38	.....	257	.....	.....	.....	8	9 77	10	2,069
	{ 1915	23,161 57	468,386	2,519	18	89	4.9	.....	16,831 60	465,683	439	95	3 44	3.6	.....	3,734 81	43	2,939
	{ 1916	35,565 79	726,442	3,180	21	104	4.9	.....	7,749 91	.....	507	.....	.....	.....	.....	7,370 82	66	3,685
Peterborough..	{ 1914	8,661 71	.....	2,692	.....	.....	.....	Flat	27,563 41	.....	602	.....	4 14	.....	Flat	7,013 23	98	3,292
	{ 1915	27,998 24	.....	3,221	.....	79	.....	.....	26,403 82	467,663	602	65	3 66	5.6	.....	30,185 83	113	3,936
	{ 1916	31,020 72	510,359	3,401	13	78	6.1	.....	.....	.....	602	.....	.....	.....	.....	36,597 04	117	4,120

Kitchener	{1912 14,585 02	1,022	.....	.....	11 + 25	19,080 32	.....	422	.....	.....	11 + 25	28,654 23	105 1,549
	{1913 15,291 37	1,291	.....	1 10	.....	19,548 91	.....	470	.....	3 65	.....	35,655 90	127 1,888
	{1914 17,757 08	559,307	1,694	20 99	4.9	19,549 45	562,630	519	95	3 29	3.5	49,173 17	130 2,343
	{1915 19,108 60	494,725	2,032	22 85	3.9	16,807 15	579,303	546	91	2 63	2.9	54,732 50	138 2,716
	{1916 20,876 63	582,754	2,407	22 79	3.6	17,323 67	801,789	543	123	2 65	2.2	62,436 31	147 3,097
St. Catharines.	{1914 2,013 49	833	.....	.....	3.7	412 75	22,843	92	.....	.....	1.9	12,742 98	20 945
	{1915 9,540 70	273,389	1,612	19 65	3.5	3,810 11	196,056	192	115	2 23	1.9	25,193 30	34 1,838
	{1916 16,419 57	591,765	2,410	24 68	2.8	3,925 49	318,877	247	121	2 25	1.5	40,688 67	48 2,705
St. Thomas....	{1912 7,596 01	620	.....	.....	.....	18,741 74	.....	300	.....	.....	11	14,761 30	60 980
	{1913 11,125 50	187,000	951	19 19	5.9	16,097 41	272,000	329	72	4 26	5.9	36,550 26	70 1,350
	{1914 13,221 00	277,539	1,499	19 90	4.8	13,480 75	346,994	384	81	3 15	3.9	44,247 13	92 1,975
	{1915 16,517 37	460,103	1,903	23 81	3.6	13,422 48	504,679	434	102	2 73	2.7	44,780 45	101 2,438
	{1916 20,210 52	629,102	2,241	25 81	3.2	15,145 47	607,131	464	93	2 81	2.5	46,698 91	107 2,812
Stratford.....	{1912 6,942 56	640	.....	90	.....	14,661 16	.....	316	.....	3 86	.....	8,834 40	76 1,032
	{1913 11,550 71	.....	1,042	.....	1 02	17,072 61	.....	367	.....	4 15	.....	14,272 59	92 1,501
	{1914 15,180 91	269,459	1,403	18 1 03	5.5	16,336 30	345,639	396	76	3 55	4.7	16,519 24	99 1,898
	{1915 16,967 58	388,200	1,724	21 90	4.4	14,766 75	400,686	439	79	2 92	3.7	15,415 78	104 2,267
	{1916 20,108 76	553,441	1,993	26 90	3.6	14,803 08	601,616	463	110	2 75	2.5	23,506 12	103 2,559
Guelph.....	{1912 10,251 87	960	.....	.....	.....	16,400 57	.....	345	.....	.....	8 + 15	30,139 00	73 1,378
	{1913 11,528 07	224,373	1,260	17 87	5.2	15,075 61	287,561	400	67	3 38	5.2	42,091 34	85 1,745
	{1914 16,920 54	286,032	1,573	17 1 00	5.9	15,923 51	325,080	441	65	3 16	4.9	38,148 46	80 2,094
	{1915 15,514 10	366,928	1,824	18 76	4.2	12,692 86	437,567	474	83	2 32	2.8	38,404 28	81 2,379
	{1916 17,221 76	469,528	2,033	20 74	3.7	13,710 72	522,526	490	91	2 36	2.6	48,369 83	86 2,609
Pt. Arthur....	{1913 81,830 66	2,409	.....	.....	.....	*	.....	500	.....	.....	8 + 25	51,748 11	55 2,964
	{1914 38,097 65	2,969	.....	.....	.....	32,933 91	.....	550	.....	.....	.....	92,804 49	55 3,574
	{1915 32,048 37	2,800	.....	.....	.....	28,662 58	.....	550	.....	.....	.....	85,060 78	50 3,400
	{1916	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Chatham	{1915 5,581 54	110,552	949	.....	5.5	2,806 81	81,805	180	.....	.....	3.4	449 70	7 1,136
	{1916 10,155 37	176,508	1,171	14 80	5.8	7,427 36	174,204	215	81	3 48	4.3	3,766 37	25 1,401
Owen Sound..	{1916 16,003 61	225,620	1,376	.....	7.1	23,724 21	388,717	435	.....	.....	6.1	13,772 61	83 1,894
Galt.....	{1912 8,183 69	830	.....	1 22	.....	9,732 86	.....	250	.....	.....	11	10,042 59	47 1,127
	{1913 10,535 38	1,122	.....	1 10	.....	11,648 49	.....	353	.....	3 25	.....	16,575 61	65 1,540
	{1914 15,797 16	300,121	1,745	20 1 08	5.3	11,952 75	289,857	339	68	2 80	4.1	23,826 87	70 2,154
	{1915 17,024 42	512,443	2,038	23 75	3.3	8,794 36	350,788	375	92	2 10	2.3	30,547 84	75 2,488
	{1916 19,961 17	716,396	2,236	28 78	2.8	10,485 26	532,860	386	115	2 30	2.0	36,029 78	79 2,701
Niagara Falls.	{1916 21,733 29	2,050	.....	.....	3.5	13,259 02	.....	400	.....	.....	Flat	9,613 01	80 2,530
Woodstock....	{1912 4,914 92	464	.....	.....	.....	13,316 02	.....	265	.....	.....	8 + 20	21,087 61	43 772
	{1913 6,495 02	100,000	636	17 1 08	6.5	12,942 32	298,000	282	77	3 95	5.2	20,262 52	55 973
	{1914 8,807 40	169,054	949	21 1 08	5.2	11,610 14	289,982	337	78	3 12	4.0	19,832 26	57 1,343
	{1915 10,472 14	230,297	1,099	20 88	4.5	11,718 95	371,787	360	90	2 80	3.1	20,742 18	62 1,521
	{1916 11,206 71	288,201	1,224	21 80	3.9	12,983 32	503,977	372	114	2 95	2.6	23,721 92	72 1,668
Brockville.....	{1916 12,897 12	144,913	965	.....	9.0	21,994 02	253,153	312	.....	.....	8.7	15,828 62	31 1,308

STATEMENT "D"—Continued

Showing Comparative Revenue, Number of Customers, Total Kw-hr. Consumption, Average Monthly Consumption per Customer, Average Monthly Bill, and Net Cost per Kw-hr. for the Years 1912, 1913, 1914, 1915 and 1916.

Municipality	Year	Domestic Light						Commercial Light						Power		Total Number of Consumers				
		Revenue	Consumption	Number of Consumers	Avg Monthly Consumption	Average Monthly Bill	Net Cost per kw-hr.	cents	prior to Hydro	Revenue	Kw-hrs.	Consumption	Number of Consumers	Avg Monthly Consumption	Average Monthly Bill		Net Cost per kw-hr.	cents	prior to Hydro	Revenue	Number of Consumers
Welland	{ 1913	1,369 67	.....	408	.....	.....	.....	8+25	.....	558 46	.....	53	53	100	2 64	2.6	8+25	.....	4,307 21	18
	{ 1914	4,411 20	117,328	492	22	82	3.7	8+25	.....	1,676 38	64,449	53	53	100	2 64	2.6	8+25	.....	8,305 71	23
	{ 1915	4,643 16	154,534	467	27	81	3.0	8+25	.....	1,600 79	69,340	57	57	105	2 42	2.3	8+25	.....	38,541 88	23
	{ 1916	4,800 06	154,706	536	26	79	3.1	8+25	.....	1,580 48	94,582	75	75	141	2 40	1.7	8+25	.....	78,184 81	24
Barrie	{ 1913	10,071 55	.....	563	.....	.....	.....	9	.....	9,252 70	.....	200	200	.....	3 85	.....	9	.....	3,390 29	13
	{ 1914	11,149 49	152,095	651	20	1 54	7.3	9	.....	9,464 64	138,948	200	200	58	3 93	6.8	9	.....	3,712 24	13
	{ 1915	11,087 68	147,307	843	18	1 24	7.1	9	.....	9,572 91	177,000	252	252	65	3 50	5.4	9	.....	4,567 76	14
	{ 1916	11,907 10	204,420	896	20	1 14	5.8	9	.....	10,635 67	189,409	257	257	63	3 50	5.6	9	.....	6,918 33	18
Collingwood ..	{ 1913	7,013 66	83,406	477	.....	.....	8.4	11+10	.....	9,362 17	108,676	220	220	.....	.....	8.4	11+10	.....	896 72	18
	{ 1914	7,857 86	103,598	554	16	1 27	7.6	11+10	.....	7,555 54	124,276	232	232	46	2 78	6.1	11+10	.....	5,165 39	21
	{ 1915	7,094 27	118,336	622	17	1 00	6.0	11+10	.....	5,688 26	116,583	233	233	42	2 04	4.9	11+10	.....	9,527 70	26
	{ 1916	8,320 44	162,464	714	20	1 04	5.1	11+10	.....	6,213 86	163,956	242	242	58	2 18	3.8	11+10	.....	23,152 41	33
Midland	{ 1912	5,878 05	.....	420	.....	.....	.....	9	.....	5,878 05	.....	165	165	.....	.....	.....	9	.....	3,188 03	18
	{ 1913	6,095 11	88,228	491	16	1 11	6.9	9	.....	6,104 16	118,267	172	172	58	3 01	5.1	9	.....	5,700 22	25
	{ 1914	6,941 07	127,397	621	19	1 06	5.5	9	.....	5,084 06	117,741	176	176	56	2 44	4.3	9	.....	6,484 43	32
	{ 1915	6,580 45	199,257	689	25	84	3.3	9	.....	4,462 54	97,300	188	188	45	2 05	4.6	9	.....	10,229 52	39
Ingersoll	{ 1916	7,145 74	180,735	732	21	83	4.0	9	.....	4,624 85	186,953	184	184	84	2 07	2.5	9	.....	12,262 89	31
	{ 1912	3,073 73	.....	220	.....	.....	.....	8+25	.....	6,648 28	.....	142	142	.....	.....	.....	8+25	.....	14,430 66	38
	{ 1913	3,595 03	43,406	278	14	1 20	8.3	8+25	.....	6,048 51	81,724	170	170	44	3 23	7.4	8+25	.....	15,293 44	44
	{ 1914	5,085 32	68,342	416	12	1 22	7.5	8+25	.....	6,359 72	106,689	194	194	46	2 32	5.9	8+25	.....	12,818 27	48
Walkerville...	{ 1915	5,480 52	102,537	497	19	1 00	5.3	8+25	.....	5,716 91	139,428	197	197	60	2 46	4.1	8+25	.....	16,251 18	52
	{ 1916	6,857 94	127,449	590	20	1 05	5.4	8+25	.....	6,540 51	176,757	206	206	73	2 70	3.7	8+25	.....	20,380 90	51
	{ 1914	3,037 96	.....	790	.....	.....	.....	15-5	.....	1,492 84	.....	175	175	.....	.....	.....	15-5	.....	6,042 11	75
	{ 1915	13,036 98	241,771	1,159	21	1 12	5.4	15-5	.....	7,836 93	157,198	195	195	70	3 49	4.4	15-5	.....	39,523 81	72
Waterloo	{ 1916	18,813 06	391,629	1,513	27	1 34	4.8	15-5	.....	12,104 72	309,727	216	216	126	4 61	3.9	15-5	.....	77,003 07	75
	{ 1912	4,057 46	.....	239	.....	.....	.....	12+25	.....	4,524 93	.....	112	112	.....	.....	.....	12+25	.....	11,545 93	35
	{ 1913	4,263 66	69,576	321	21	1 27	6.1	12+25	.....	5,098 42	87,718	125	125	62	3 58	5.8	12+25	.....	14,970 14	44
	{ 1914	4,723 94	85,199	430	19	1 05	5.5	12+25	.....	4,825 22	98,924	153	153	59	2 90	5	12+25	.....	13,282 14	51
Waterloo	{ 1915	5,401 82	106,570	524	19	94	5.1	12+25	.....	5,284 87	107,821	162	162	57	2 80	4.9	12+25	.....	15,125 32	53
	{ 1916	5,454 60	145,196	592	22	81	3.8	12+25	.....	4,750 09	130,418	150	150	69	2 54	3.6	12+25	.....	17,905 45	50

Goderich.....	{1914 1915 1916}	7,197 05 6,072 51 7,086 32	83,805 92,406 108,654	400 441 511	..... 18 1 20 19 1 24	8.6 6.6 6.5	9	4,196 49 5,066 76 5,253 15	79,874 121,559 98,221	155 168 159	..... 62 2 60 50 2 68	5.3 4.1 5.4	9	1,240 73 5,645 26 5,498 56	10 8 9	565 617 679
Dundas.....	{1913 1914 1915 1916}	3,045 85 5,349 24 6,139 97 6,925 46	..... 92,168 128,600 146,710	377 520 613 673	..... 19 99 19 90 19 89	..... 5.8 4.8 4.8	10+25	4,193 27 4,198 64 4,310 96 4,714 78	..... 119,947 157,477 179,151	134 153 160 168	..... 69 2 44 84 2 29 91 2 39	..... 3.5 2.7 2.6	10+25	3,070 40 4,305 96 5,930 54 10,915 58	27 30 37 35	538 703 810 876
Preston.....	{1912 1913 1914 1915 1916}	4,234 68 5,477 10 6,520 39 6,615 91 7,341 15	..... 83,852 108,257 129,896 186,361	341 526 629 714 785	..... 16 1 05 14 90 16 82 21 82	..... 6.5 5.1 3.9	9+20	5,237 99 5,366 77 5,011 15 4,488 76 4,779 76	..... 103,000 106,675 118,756 155,325	131 151 165 174 182	..... 61 3 18 56 2 64 58 2 21 72 2 24	..... 5.2 4.7 3.8 3.1	9+20	15,478 14 21,017 68 21,975 26 21,698 34 22,624 37	21 28 29 30 34	492 705 823 918 1,001
Paris.....	{1914 1915 1916}	4,766 23 5,071 54 5,877 57	65,037 87,239 127,382	354 477 552	..... 17 1 01 21 96	..... 5.8 4.6	7+10	2,778 09 4,063 03 3,805 95	65,108 100,259 96,750	142 150 161	..... 57 2 32 53 2 11	..... 4.3 4.1 3.9	8+20	1,419 90 6,328 33 8,974 66	1 4 2	497 631 706
Wallaceburg..	{1915 1916}	4,079 74 5,095 45	56,482 68,988	368 438	..... 15 1 05	..... 7.2 7.4	11	4,239 30 4,589 30	63,747 67,718	161 354	..... 22 1 48	..... 6.6 6.8	10	87 32 5,866 32	2 5	531 593
Simcoe.....	{1915 1916}	351 67 1,857 61	5,227 13,238	35 57	..... .....	..... 6.7 6.5	9+15	1,386 89 2,292 28	26,852 46,254	61 84	..... 53 2 63	..... 5.1 5.0	9+15	766 42 1,386 33	8 12	104 153
Brampton	{1912 1913 1914 1915 1916}	3,004 66 5,617 61 6,798 89 6,073 97 6,660 66	..... ..... 142,178 159,435 165,435	409 643 627 691 722	..... 18 89 20 86 20 79	..... 4.9 4.3 4.0	9+15	2,893 74 3,986 65 4,055 99 4,053 56 4,013 51	..... ..... 101,751 116,717 153,542	104 138 174 174 175	..... ..... 55 2 17 56 1 94 73 1 92	..... ..... 4.0 3.5 2.6	9+15	3,531 34 10,557 72 10,658 33 11,024 83 12,922 72	12 16 21 21 24	525 797 822 886 921
St. Mary's....	{1912 1913 1914 1915 1916}	4,967 16 3,815 77 4,614 95 5,073 97 5,020 33	..... 44,801 67,375 72,819 127,274	240 396 454 528 563	..... 12 1 00 13 90 12 86 19 77	..... 8.5 6.7 6.9 3.9	9+15	4,069 20 4,553 73 4,733 33 4,222 53 3,161 26	..... 62,486 75,257 75,644 79,768	143 160 161 151 161	..... 34 2 50 39 2 46 40 2 25 42 1 69	..... ..... 6.3 5.5 4.0	9+15	6,001 30 8,221 72 10,610 05 8,379 87 9,266 74	20 29 30 33 28	403 588 645 712 752
Penetang	{1912 1913 1914 1915 1916}	1,676 26 1,989 80 1,936 73 2,050 69 2,317 37	..... 27,199 35,163 42,843 49,242	101 128 153 174 189	..... 19 1 44 21 1 15 22 1 04 23 1 06	..... 7.3 5.5 4.8 4.7	9	3,836 30 4,511 16 3,064 83 2,676 60 2,706 74	..... 58,111 66,489 78,657 83,448	87 91 100 102 95	..... 55 4 23 58 2 68 65 2 21 71 2 30	..... ..... 4.6 3.4 3.2	9	2,207 51 8,775 95 8,001 69 10,048 08 11,650 03	13 15 15 15 16	201 234 268 291 290
Tillsonburg ...	{1912 1913 1914 1915 1916}	3,233 92 2,796 57 3,367 74 3,203 51 4,009 67	..... 29,115 45,937 55,346 72,975	200 254 300 348 375	..... 10 1 03 14 1 02 14 83 18 1 02	..... 9.6 7.3 5.7 5.5	11+25	3,350 91 4,677 38 4,579 37 4,236 42 4,493 41	..... 66,049 70,265 74,564 95,326	128 143 160 161 188	..... 41 2 87 38 2 52 38 2 19 46 2 14	..... ..... 6.5 5.7 4.7	11+25	3,283 75 4,763 15 6,303 09 5,619 15 5,692 05	6 17 16 15 17	334 414 476 524 580
Strathroy	{1915 1916}	3,380 78 3,318 45	36,200 51,197	233 314	..... 16 1 01	..... 9.3 6.5	12+25	4,701 76 3,817 38	50,469 66,325	147 152	..... 37 2 12	..... 9.3 5.8	12+25	700 49 2,927 36	5 8	385 574

STATEMENT "D"—Continued

Showing Comparative Revenue, Number of Customers, Total Kw-hr. Consumption, Average Monthly Consumption per Customer, Average Monthly Bill, and Net Cost per Kw-hr. for the Years 1912, 1913, 1914, 1915 and 1916

Municipality	Year	Domestic Light						Commercial Light						Power		Total Number of Consumers
		Revenue \$	Kw-hrs.	Number of Consumers	Avg Monthly Consumption	Net Cost per Kw-hr	Net Cost prior to Hydro	Revenue \$	Kw-hrs.	Number of Consumers	Avg Monthly Consumption	Net Cost per Kw-hr	Net Cost prior to Hydro	Revenue \$	Number of Consumers	
Hesper.	{ 1913	2,189 00	.....	174	.....	.....	10 + 15	1,684 75	.....	76	.....	.....	10 + 15	5,044 30	11	281
	{ 1914	2,635 41	34,848	229	14	1 09	7.6	1,934 75	35,979	85	37	2 00	5.4	6,116 27	13	327
	{ 1915	2,787 48	39,580	272	11	90	7.0	2,334 15	39,657	90	38	2 22	5.9	9,017 58	14	376
	{ 1916	3,011 73	54,239	277	17	92	5.5	2,012 28	44,900	84	43	1 93	4.5	11,177 71	12	273
Prescott	{ 1914	4,868 75	.....	342	.....	.....	9	3,600 00	.....	122	.....	.....	9	1,099 27	10	474
	{ 1915	4,058 14	67,130	369	16	95	6.0	3,033 62	62,647	145	39	1 89	4.8	3,431 45	11	525
	{ 1916	4,186 96	63,304	380	15	93	6.6	3,611 95	71,794	133	43	2 16	5.0	4,141 90	22	525
Ridgetown ...	1916	2,173 64	24,975	174	.....	.....	8.7 10 + 25	2,838 32	32,594	101	.....	.....	8.7 10 + 25	740 86	31	278
Elmira...	{ 1914	1,908 41	20,875	158	.....	.....	9.5 11.4 + 10	2,020 81	28,490	65	.....	.....	11.4 + 1	1,876 49	8	231
	{ 1915	2,059 11	27,576	185	13	1 00	7.5	1,674 44	28,368	85	32	1 85	5.9	2,801 33	10	280
	{ 1916	2,211 16	30,817	233	12	88	7.2	1,665 69	35,414	92	33	1 56	4.7	3,635 22	12	338
Weston	{ 1912	3,979 81	.....	225	.....	.....	7.2 + 22.5	750 00	.....	15	.....	.....	7.2 + 22.5	1,674 28	4	344
	{ 1913	4,117 20	.....	360	.....	.....	.....	1,475 74	.....	34	.....	.....	.....	6,166 97	6	400
	{ 1914	3,741 84	79,766	352	17	80	4.7	1,599 97	26,774	78	40	2 38	6.0	4,958 59	10	440
	{ 1915	4,407 36	96,186	441	21	93	4.6	1,305 90	27,564	90	27	1 30	4.7	4,798 33	9	540
	{ 1916	5,477 65	135,272	475	25	100	.....	1,407 31	31,898	88	30	1 31	.....	5,202 84	11	574
Clinton	{ 1914	2,023 70	21,466	179	.....	.....	9.4 10 + 25	2,028 08	24,696	111	.....	.....	8.2 10 + 25	1,255 33	7	297
	{ 1915	2,930 57	36,598	204	16	1 28	8.2	3,068 63	40,234	110	20	2 31	7.6	2,018 24	6	320
	{ 1916	3,161 29	41,986	211	17	1 27	7.5	3,064 37	41,205	112	31	2 30	7.4	2,498 64	7	330
Milton	{ 1913	1,149 28	.....	110	.....	.....	10	1,212 26	.....	74	.....	.....	10	6,462 38	5	189
	{ 1914	1,961 22	25,649	150	19	1 51	7.6	2,226 80	41,015	79	44	2 43	5.4	11,325 61	6	235
	{ 1915	1,981 80	28,900	170	15	1 03	6.8	1,900 98	41,520	80	44	2 00	4.6	5,364 29	7	257
	{ 1916	2,219 28	36,573	197	16	1 01	.....	1,892 21	44,445	84	45	1 93	.....	10,428 79	6	287
Mimico	{ 1913	2,021 06	.....	250	.....	.....	8 + 25	*	.....	*	.....	.....	8 + 25	795 49	5	255
	{ 1914	5,085 16	91,184	462	.....	.....	5.4	3,462	.....	10	.....	.....	5.4	963 64	5	477
	{ 1915	5,748 44	105,884	609	17	90	5.4	346 49	6,551	7	40	2 14	5.3	1,042 11	3	619
	{ 1916	7,011 08	137,318	621	18	95	5.1	506 44	10,982	31	38	1 76	4.6	1,449 14	8	660

Seaforth.....	{1913 1914 1915 1916}	2,124 18 2,467 36 2,593 70 3,045 65	24,665 37,453 43,162 51,884	178 211 238 280	..... 16 1 06 16 96 17 97	8.6 6.8 6.0 5.9	8+25	2,876 47 2,581 30 2,724 84 2,941 03	105 112 111 110	..... 35 1 98 37 2 03 43 2 22	8.3 5.6 5.6 5.2	7,509 99 7,707 01 7,685 52 9,684 11	10 10 11 12	293 333 360 402	
	{1915 1916}	1,314 03 1,621 27	19,328 24,275	114 149	..... 16 1 03	6.8 7.2	10+25	2,367 91 2,111 16	91 92	..... 32 2 00	6.3 10 6.0	882 24 2,819 21	7 7	212 248	
	Mt. Forest.....	1916	1,967 03	27,337	106	.....	7.2 10		2,420 75	164	.....	6.2 10	1,739 79	7	277
	Palmerston...	1916	6,102 25	.....	151	.....	.....	Flat	282 57	63	.....	.....	Flat	1	215
Durham	1916	1,518 72	17,091	155	.....	8.9	Flat	1,057 33	67	.....	.....	8.8	Flat	.....	222
	{1913 1914 1915 1916}	661 49 3,069 02 2,999 83 3,174 63	42,328 43,392 56,191	160 242 294 306	..... 17 1 27 14 93 16 88	..... 7.2 10 6.9 5.6	10	842 87 2,362 33 2,276 41 2,101 00	50 75 97 99	..... 59 3 15 34 2 20 45 1 79	..... 8 8.9 3.3	234 32 2,976 61 8,734 01 10,726 24	5 17 16 21	285 334 407 426	
	Tilbury	{1915 1916}	979 57 1,507 37	..... 21,483	123 127	..... 14 1 00	..... 6.5	10	1,476 53 2,071 77	67 79	..... 37 2 36	10 4.5	..... 149 60	..... 2	190 218
	Acton	{1913 1914 1915 1916}	1,236 50 1,463 72 1,931 11 1,942 11	..... 21,192 29,079 29,685	82 146 183 185	..... 15 15 15	..... 6.9 6.6 6.5	10	1,567 48 1,496 18 1,725 73 1,592 62	62 58 53 60	..... 28 2 08 36 2 59 52 2 35	..... 7.5 7.1 4.5	318 77 836 13 1,019 27 1,565 53	3 5 5 7	147 209 241 252
Mitchell	{1912 1913 1914 1915 1916}	2,964 48 2,362 52 2,470 29 2,379 58 2,311 80	..... ..... ..... 33,759	159 179 191 190 218	..... ..... ..... ..... 14 95	..... ..... ..... ..... 6.8	Flat	2,977 08 2,813 92 2,712 55 2,684 01 2,677 35	79 85 100 95 103	..... ..... ..... ..... 33 2 25	..... ..... ..... ..... 6.8	..... Flat	4,597 03 6,160 53 3,944 91 2,333 08 3,231 56	13 16 16 17 21	251 270 307 292 342
	New Hamburg.	{1912 1913 1914 1915 1916}	1,195 08 1,589 21 1,779 90 1,888 04 1,816 44	..... ..... 23,010 33,913 37,109	124 142 170 187 196	..... ..... 12 89 16 88 16 79	..... ..... 7.7 4.9 5.5	10	1,423 35 1,890 72 1,403 56 1,273 38 1,211 25	63 63 68 70 70	..... ..... 25 1 78 27 1 54 32 1 39	..... ..... 7.2 5.5 4.6	3,369 05 5,792 20 5,209 51 2,825 57 1,646 90	5 8 6 4 4	192 213 244 261 270
		Dresden	{1915 1916}	1,093 68 1,995 51 26,473	185 197 12 87 7.5	Flat	1,223 25 1,986 21	109 106 24 1 54 6.5 Flat	294 303
		Victoria Harbor	{1915 1916}	105 79 642 29	56 65		117 85 1,171 37	34 31	90 96
Pt. Dalhousie.		{1913 1914 1915 1916}	3,742 54 3,656 01 3,608 70 2,868 05	..... ..... ..... .....	238 240 250 330	..... ..... ..... .....	..... Flat		* * 782 99	* 10 10 32	..... ..... ..... .....	..... Flat	347 28 429 54 252 12 339 12	3 3 2 8	241 253 262 370
	Caledonia.....	{1913 1914 1915 1916}	404 60 880 54 265 62 263 39	..... ..... 4,618 4,800	17 21 24 27	..... ..... 16 98 16 86	..... ..... 5.4 5.5	None	* 950 38 777 38	16 32 33 37	..... ..... 47 2 44 47 1 85	..... ..... 5.4 4.	470 34 188 54 138 42 519 82	1 1 1 3	34 54 58 67

STATEMENT "D"—Continued

Showing Comparative Revenue, Number of Customers, Total Kw-hr. Consumption, Average Monthly Consumption per Customer, Average Monthly Bill, and Net Cost per Kw-hr. for the Years 1912, 1913, 1914, 1915 and 1916

Municipality	Year	Domestic Light							Commercial Light							Power		Total Number Consumers
		Consumption			Average			Net Cost per Kw-hr.	Revenue	Consumption	Number of Consumers	Av'g Monthly Consumption	Average Monthly Bill	Net Cost per Kw-hr.	Net Cost prior to Hydro	Revenue	Number of Consumers	
		\$	c.	Kw-hrs.	Kw-hr.	\$	c.												Kw-hrs.	$	c.	Kw-hr.	Cents	Cents
Norwich	{ 1912	862 17	.....	128	15	1 09	6.8	10 + 25	674 48	64	.....	.....	.....	10 + 25	263 93	2	194
	{ 1913	1,926 78	28,172	166	15	1 09	6.8	10 + 25	1,162 98	76	20	1 38	6.5	10 + 25	1,978 55	3	245	
	{ 1914	2,168 13	35,578	198	16	99	6.2	10 + 25	995 16	84	22	1 04	6.4	10 + 25	1,893 72	3	285	
	{ 1915	2,529 91	37,082	228	16	99	6.2	10 + 25	1,075 79	80	26	1 09	4.2	10 + 25	2,169 31	5	313	
	{ 1916	2,319 58	49,858	234	18	84	4.7	10 + 25	1,168 34	87	25	1 16	4.7	10 + 25	2,642 97	6	327	
New Toronto ..	{ 1914	653 50	11,947	100	7.0	8 + 25	4	7.0	8 + 25	1	105
	{ 1915	1,416 10	19,520	153	5.5	8	5.5	2,140 36	2	163
	{ 1916	1,571 03	29,162	210	5.4	143 32	10	5.4	9,744 31	4	224
Waterford	{ 1915	685 22	75	546 08	40	115
	{ 1916	1,112 28	14,220	99	14	1 08	7.8	10	796 50	42	20	1 62	8.1	10	1,007 74	2	143	
Elora	{ 1915	1,044 49	14,009	89	7.4	10 + 25	1,820 07	60	7.1	10 + 25	197 78	1	150
	{ 1916	1,253 03	20,500	105	18	1 08	6.1	10 + 25	1,828 25	63	38	2 48	6.5	10 + 25	972 12	2	170	
Hagersville ...	{ 1913	81 92	.....	3	.....	.....	.....	.....	*	24	.....	.....	.....	.....	746 85	3	30
	{ 1914	1,222 23	16,053	70	5.4	None	6,446	60	5.4	None	2,679 08	3	133
	{ 1915	1,172 85	23,213	114	21	1 06	5.1	.....	1,592 59	73	28	1 99	5.2	.....	2,434 62	3	190
	{ 1916	1,606 80	30,025	127	21	1 11	5.4	.....	1,343 82	69	32	1 58	4.8	.....	2,527 92	4	200
Winchester ...	{ 1914	1,672 09	103	1,300 00	50	153
	{ 1915	1,698 40	28,610	120	21	1 27	5.9	15	1,336 85	30	50	2 23	7.6	15	.....	.....	171
	{ 1916	1,812 29	36,931	135	24	1 18	5.4	.....	1,364 47	46	38	2 37	6.2	.....	227 52	1	182
Pt. Credit	{ 1913	1,963 22	.....	93	.....	.....	.....	.....	*	21	.....	.....	.....	.....	848 59	2	116
	{ 1914	2,461 42	41,862	125	6.0	None	35	6.0	None	308 88	2	162
	{ 1915	1,975 29	36,484	141	23	1 24	5.4	.....	587 11	33	44	1 18	3.3	.....	236 47	3	177
	{ 1916	1,781 49	44,251	145	26	1 04	4.0	.....	464 02	33	35	1 17	3.3	.....	257 40	3	181
Beaverton	{ 1915	1,484 62	.....	131	.....	.....	.....	.....	1,149 67	56	.....	.....	.....	.....	456 74	5	192
	{ 1916	1,417 39	20,685	131	13	90	6.9	Flat	1,065 23	60	25	1 53	6.1	Flat	383 45	6	197	
Stayner	{ 1913	158 48	.....	120	.....	.....	.....	.....	116 91	30	.....	.....	.....	.....	301 86	2	152
	{ 1914	909 58	9,200	108	7	66	9.9	.....	747 93	56	20	1 45	6.7	.....	1,699 08	2	156
	{ 1915	995 47	11,845	106	9	78	8.4	Flat	933 55	56	20	1 39	6.8	Flat	1,694 94	2	164	
	{ 1916	1,012 15	11,995	115	9	76	9.2	.....	997 39	65	18	1 37	7.7	.....	1,835 29	3	183

Cannington ...	{1915 1916	1,549 40 1,720 25	25,049 17,243	135 150	151 1 00 151 1 03	6.9 12.5 7.8	1,120 04 973 63	65 73	17 1 17 17 1 17	7.1 12.5 7.1 12.5	464 26 462 47	6 7	206 230
Dutton	{1915 1916	318 85 1,353 04	3,970 17,243	108 112	206 59 960 27	8.0 7.8	206 59 960 27	43 52	23 1 34 23 1 34	7.3 7.2	135 31 135 31	1 1	152 165
Pt. Stanley ...	{1912 1913 1914 1915 1916	897 02 1,828 06 2,066 41 2,498 57 2,956 97	..... ..... ..... ..... .....	122 182 229 274 308	..... ..... ..... ..... .....	..... ..... ..... ..... .....	1,106 63 1,771 70 1,753 60 1,736 42 1,551 37	40 60 72 73 72	..... ..... ..... ..... .....	..... ..... ..... ..... .....	1,314 70 2,418 00 2,170 83 2,064 76 1,985 92	3 9 12 9 11	165 251 313 356 391
Chesterville..	{1914 1915 1916	530 13 919 27 1,490 99	7,672 12,663 15,779	68 85 89	..... 14 1 00 17 1 43	6.9 7.2 9.4	791 67 1,187 54 1,240 56	35 49 47	..... 21 2 06 26 2 12	7.7 9.8 8.2	..... ..... 177 55	..... ..... 1	103 134 137
Ayr	{1915 1916	892 63 1,084 46	16,031 12,314	79 83	..... 13 1 12	5.5 8.8	773 08 804 00	35 48	26 1 61 26 1 61	8.1 6.2	348 78 393 39	1 2	115 133
Watdown ...	{1912 1913 1914 1915	774 40 1,003 09 1,054 13 1,202 41	..... ..... 13,360 18,017	41 70 71 84	..... ..... 16 1 25 19 1 30	..... ..... 7.9 6.7	340 00 361 20 535 83 567 65	20 34 34 30	..... ..... 20 1 31 23 1 48	..... ..... 6.5 6.7	614 42 917 65 1,011 38 1,207 80	2 2 5 7	63 106 110 121
Thamesville ..	{1915 1916	378 79 1,729 79	..... 19,061	107 137	..... 13 1 18	6.5 9.1	575 10 283 36	32 53	24 1 55 20 1 52	6.4 7.8	1,149 78	6	131 196
Bolton	{1915 1916	624 86 926 86	6,563 9,322	59 70	..... 12 1 20	9.5 9.9	553 80 882 25	42 36	..... 28 1 88	7.6 6.7	313 74 3,947 32	3 4	104 110
Ailsa Craig ...	1916	579 57	6,270	51	.....	9.2	213 46	11	.....	11.2	15 57	1	63
F'lesherton....	1916	568 76	.....	73	.....	.....	423 83	30	.....	.....	.....	.....	103
Dundalk	1916	924 30	.....	88	.....	.....	960 58	63	.....	.....	618 52	2	153
Bothwell	{1915 1916	230 61 928 16	..... 8,662	68 78	..... 10 1 03	..... 10.7	191 21 768 57	32 52	..... 17 1 46	..... 8.9	..... .....	..... .....	100 130
Lucan	{1915 1916	824 07 1,124 73	12,047	87 98	..... 11 1 00	9.3	687 37 857 11	39 42	..... 17 1 78	..... 10.2	18 66 159 67	3 7	129 147
Woodbridge ..	{1915 1916	367 49 507 10	4,878 7,059	42 58	..... 13 89	7.5 7.0	443 53 556 82	33 33	..... 17 1 40	9.0 7.9	498 44 2,221 33	2 7	77 98
Greenmore	{1915 1916	699 81 922 41	6,399 9,678	78 78	..... 14 1 00	10.9 7.2	937 84 1,041 90	59 44	..... 15 1 72	12.2 11.9	939 20 1,151 96	1 2	138 132
Coldwater	{1913 1914 1915 1916	405 43 853 56 874 94 977 62	..... 12,466 16,706 16,599	48 62 66 70	..... 19 1 30 21 1 15 20 1 20	..... 6.8 5.3 5.9	330 25 589 85 703 35 848 82	32 39 37 39	..... 24 1 40 31 1 54 36 1 85	..... 5.7 5.1 5.1	247 19 617 26 363 88 247 91	1 2 2 2	81 103 105 111
Embro	{1915 1916	400 50 633 95	..... 5,690	65 58	..... 7 85	..... 11.1	489 67 598 41	30 29	..... 29 1 66	..... 5.8	..... 155 54	..... 2	95 89

STATEMENT "D"—Continued

Showing Comparative Revenue, Number of Customers, Total Kw-hr. Consumption, Average Monthly Consumption per Customer, Average Monthly Bill, and Net Cost per Kw-hr. for the Years 1912, 1913, 1914, 1915, 1916

Municipality	Year	Domestic Light							Commercial Light							Power		
		Revenue	Consumption	Number of Consumers	Avg Monthly Consumption	Net Cost per Kw-hr.	Net Cost	Revenue	Consumption	Number of Consumers	Avg Monthly Consumption	Net Cost per Kw-hr.	Net Cost	Revenue	Number of Consumers	Total Number Consumers		
		\$ c.	Kw-hrs.		\$ c.	Cents		\$ c.	Kw-hrs.		\$ c.	Cents		\$ c.				
Woodville	{1915	324 34	5,049	35	92	9.8	12.5	563 68	6,618	28	21	62	7.7	1,149 17	3	66		
	{1916	496 52		41				512 07		24				1,185 54	3	68		
Baden.....	{1913	884 11		75		None	None	*		*		None		2,242 77	4	79		
	{1914	1,247 81	6,920	82	7	10.0		5,547		*	7	75	10.0	4,580 23	4	86		
	{1915	938 33	12,729	72	13	98	7.4	*		*	13	98	7.4	4,588 87	4	76		
	{1916	808 21	8,824	84	16	86	5.5	*	5,772	*	16	86	5.5	5,059 33	5	89		
Breehin	{1915	148 83		13		None	None	407 78		14		None		1,007 59	1	28		
	{1916	172 42	1,836	16	11	1 02	9.4	404 76	5,370	20	28	2 00	7.5	1,153 32	1	37		
Beachville....	{1913	562 97		45		None	None	*		*		None		5,993 81	4	49		
	{1914	587 33	4,422	45		7.9		2,988		*			7.9	5,368 04	4	49		
	{1915	363 33	5,356	37	11	74	6.8	296 37	4,847	12	34	2 05	6.1	5,593 15	4	53		
	{1916	400 81	5,891	42	13	84	6.8	263 62	3,872	12	27	1 83	6.8	5,393 02	3	57		
Burford	{1916	577 69	9,005	64		6.4	Flat	380 44	7,569	30		Flat	5.0	519 72	1	95		
	{1915	214 87	3,181	33		6.8	None	274 49	3,497	33		None	7.8			66		
Comber.....	{1916	538 57	5,894	37	14	1 32	9.1	678 58	6,729	37	15	1 50	10.1			74		
	{1915	304 49		40			None	288 99		30		None		159 85	1	71		
Drumbo	{1916	340 75	4,481	35	10	77	7.5	277 43	3,718	22	15	1 12	7.6	116 57		57		
	{1915	146 16		22			None	114 18		10		None				33		
Delaware	{1916	354 60	2,835	23	11	1 35	12.5	141 64	1,823	12	14	1 07	7.8			35		
	{1915	579 23	6,840	61		8.5	None	309 88	4,806	18			6.4	287 95	2	81		
Dorechester....	{1916	613 03	7,329	61	10	1 84	8.4	275 82	4,879	16	19	1 35	5.7	667 93	2	79		
	{1916	254 76	3,500	24		7.3	None	227 57	4,430	10			5.1	650 38	1	35		
Elmvale.....	{1913	284 34		52		None	None	358 60		52		None				105		
	{1914	673 18	6,856	57	10	1 03	9.9	896 11	15,402	48	25	1 49	5.8	438 38	2	107		
	{1915	704 12	7,728	78	10	87	9.1	778 93	16,193	64	25	1 16	3.9	1,186 44	2	144		
	{1916	816 74	10,562	81	11	85	7.7	736 74	18,644	62	25	97	5.0	1,043 96	3	146		

Lambeth	{1915 1916}	344 47 575 65	2,991 6,880	49 54	..... .....	11.5 8.4	None	119 00 208 96	1,042	9 13	..... .....	11.4 8.3	None	559 82 249 36	1 1	59 68
Mt. Brydges ..	{1915 1916}	333 43 644 75	5,058 6,061	45 55	..... .....	..... 12.7	None	494 02 170 46	3,106	15 15	..... .....	..... 5.5	None	517 50 760 58	1 2	61 72
Plattsville....	{1915 1916}	551 39 666 30	7,422	56 60	..... .....	9.1 9.0	None	477 71 580 62	5,091 5,900	20 22	..... .....	9.4 9.8	None	1,128 27 1,436 62	4 3	80 85
Princeton	{1915 1916}	440 42 657 80	7,739	30 44	..... .....	..... 8.5	None	81 57 127 81	..... 1,278	15 11	..... .....	..... 10.6	None	..... 192 92	..... .....	45 55
Pt. McNicoll ..	{1915 1916}	415 03 618 82	6,037 9,450	60 66	..... .....	6.8 6.5	None	311 20 301 92	6,542 4,738	26 21	..... .....	4.7 6.4	None	..... 7 37	..... 1	86 88
Rockwood	{1913 1914 1915 1916}	230 27 848 55 731 97 733 66	7,824 9,500 11,263	48 54 65 72	..... ..... ..... .....	..... 8.8 7.7 6.5	None	* * 251 27 388 05	..... ..... 3,300 5,930	9 7 10 11	..... ..... ..... .....	..... ..... 8.8 7.7 6.4	None	480 82 1,542 01 907 57 903 57	1 3 3 5	58 64 78 87
Sunderland ...	{1915 1916}	794 83 752 64	7,714	57 61	..... .....	..... 9.8	12.5	939 85 840 22	..... 9,644	36 37	..... .....	..... 9.0	12.5	..... 211 86	..... 1	93 99
St. George	{1915 1916}	203 23 832 23	11,483	39 56	..... .....	..... 7.2	None	139 16 474 38	..... 7,031	14 24	..... .....	..... 6.7	None	311 30 583 52	1 2	54 82
Thorndale	{1914 1915 1916}	446 27 299 37 328 67	2,787 2,816 3,597	34 32 33	..... ..... .....	7.8 10.6 9.1	None	..... 374 09 403 01	2,989 3,653 3,709	18 20 21	..... ..... .....	7.8 10.2 10.9	None	329 27 542 53 459 79	1 1 1	53 53 55
Thamesford ..	{1914 1915 1916}	393 49 574 34 642 21	3,086 6,676 7,540	44 59 64	..... ..... .....	10.9 8.6 8.5	None	323 92 481 78 537 42	3,445 5,886 6,768	26 26 29	..... ..... .....	9.4 8.2 7.9	None	946 32 423 21 268 23	2 2 2	72 87 95
Williamsburg.	{1915 1916}	403 72 568 66	7,392	44 41	..... .....	..... 7.7	None	139 26 224 29	..... 3,934	9 9	..... .....	..... 5.7	None	..... 285 73	1 1	54 51
Waubasheh.	{1915 1916}	516 34 646 58	7,296 8,233	49 58	..... .....	7.0 7.9	None	220 50 496 47	2,979 7,534	15 20	..... .....	7.7 6.6	None	32 28 49 52	1 1	65 79

STATEMENT "E"

Street Light Installation in Hydro Municipalities, December 31st, 1916, showing Cost per Year, Cost per Lamp, and Cost per Capita.

Municipality	Population	Number of Lamps	Size and Style of Lamps	Cost per Lamp	Total Cost	Cost per Capita
				\$ c.	\$ c.	\$ c.
Toronto	463,705	{ 24 452 41,739	{ 500 w. Nitro m 5 lt. Stds. m 100 watt m	{ 45 00 40 00 8 00	361,920 32	78
Hamilton	100,461	{ 401 501 294 7,270 10 6 12	{ 500-Watt m 250 " m 200 " m 100 " m 150 " m 60 " m 40 " m	{ 40 00 12 00 12 00 7 20 special special	80,815 73	80
Ottawa	100,163	{ 59 671 44 429 2,870 313	{ arcs s 400-watt s 250 " s 75 " s 100 " m 100 " m	{ 45 00 45 00 35 00 10 00 60c. per ft. 6 00	60,632 48	61
London	58,055	{ 2,461 193 22 18 96 146	{ 75 " s 200 " m 300 " s 400 " s 500 " m 100 " m	{ Special Special Special Special Special Special	31,719 17	55
Brantford	25,420	{ 147 2,850 7	{ mag. arcs s 100-watt s 150 " s	{ 40 00 7 50 9 00	27,500 83	1 08
Windsor	24,162	{ 280 1,948 145	{ 500 " s 75 " s arcs s	{ 50 00 12 00 50 00	37,266 17	1 54
Peterboro'	20,426	{ 56 350 10	{ magnetites s 60-watt s 500 " m	{ 50 50 9 00 33 00	13,257 49	65
Kitchener	19,266	{ 26 1,973 1,970	{ 400 " m 100 " s 100 " s	{ 29 00 9 00 8 00	18,621 19	97
St. Catharines....	17,880	{ 113 20 987 11	{ 500 " s arcs s 75 " s 500 " s	{ 37 50 55 00 9 50 50 00	15,261 33	85
St. Thomas	17,174	{ 164 5 767	{ 500 " s 500 " s 75 " s	{ 45 00 40 00 10 00	14,690 24	85
Stratford	17,081	{ 1,103 1,661 15	{ 100 " m 100 " m 100 " m	{ 8 50 7 49 5 62	15,753 20	92
Guelph	16,735	{ 724 69 83	{ 60 " m 500-watt s 400 " s	{ 4 78 36 75 30 00	9,518 72	57
Port Arthur	14,307	{ 31 646 53	{ 100 " s 100 " s 400 C. P. s	{ 11 00 12 00 50 00	15,207 40	1 06
Chatham	12,863	{ 114 249 78	{ 75-watt s 60 " m 500 " m	{ 11 00 11 00	13,169 02	1 02
Owen Sound	11,910	{ 97 279 853	{ 300 " m 190 " m 75 " s	{	7,000 00	59
Galt	11,852	{	{	{	12,567 40	1 06
Sarnia	11,676	{	{	{	3,480 00	*

STATEMENT "E"—Continued

Street Light Installation in Hydro Municipalities, December 31st, 1916, showing Cost per Year, Cost per Lamp, and Cost per Capita.

Municipality	Population	Number of Lamps	Size and Style of Lamps	Cost per Lamp	Total Cost	Cost per Capita
				\$ c.	\$ c.	\$ c.
Niagara Falls....	11,147	{ 30 16 101 57 413	{ arc C. s arc T. s ornam. s 32 C.P. m 100-watt s	{ 50 00 50 00 50 00 6 00 12 00	12,849 81	1 15
Woodstock.....	10,084	{ 50 678	{ 250 " s 100 " s	{ 24 00 9 00	7,355 01	73
Brockville.....	9,428	{ 52 34 503	{ 5 lt. Stds. m 3 lt. Stds. m 80 C.P. m	{	9,000 00	95
Welland.....	7,243	{ 345 96	{ 100-watt m 200 " m	{ 9 00 18 00	5,181 00	72
Barrie.....	6,453	433	100 " s	12 00	5,323 67	82
Collingwood	6,361	394	100 " m	10 00	3,940 00	62
Midland.....	6,258	{ 16 276 26	{ 750 " s 100 " s 650 " s	{ 40 00 10 00	3,330 46	53
Ingersoll	5,176	{ 220 67 691	{ 75 " s 60 " s 60 " m	{ 11 50 11 00 5 60	3,729 00	72
Walkerville.....	5,096	{ 94 17 44 8	{ 100 " m 60 " m 5 lt. Stds. m 3 " m	{ 12 00 12 00 40 00 25 00	9,039 04	± 77
Waterloo	4,956	{ 38 14 382	{ 60-watt m 100 " m 100 " s	{ 8 75 10 50 8 75	5,798 75	1 17
Goderich	4,655	{ 275 16 8 8	{ 75-watt s 5 lt. Stds. m 1 " m 1 " m	{ 14 00 50 00 40 00 25 00	5,162 39	1 11
Dundas.....	4,652	{ 301 30 24 5	{ 100-watt m W. Hamilton m Ancaster m Greensville m	{ 9 00 14 00 12 00 12 00	3,547 73	± 58
Preston.....	4,643	{ 222 47	{ 75-watt s 100 " s	{ 11 00 12 00	3,044 92	65
Paris	4,370	400	100 " s	11 00	4,576 00	1 05
Wallaceburg	4,107	{ 170 28	{ 75 " s 400 " s	{ 13 50 30 00	3,094 56	75
Simcoe	4,061	{ 27 228	{ 300 " s 75 " s	{ 38 00 14 00	3,500 00	86
Brampton	4,041	570	100 " m	7 50	4,262 17	1 05
St. Mary's.....	3,958	{ 113 198	{ 250 " s 100 " s	{ 25 00 13 00	5,390 33	1 36
Penetang.....	3,928	{ 170 2	{ 100 " s s	{ 12 00 27 50	2,095 00	55
Petrolia.....	3,891	{ 136 24	{ 100-watt s 600 " s	{ 15 50 55 00	.....	*
Tillsonburg.....	3,084	216	75 " s	11 00	2,595 96	84
Strathroy.....	2,998	{ 32 283	{ 200 " s 75 " s	{ 23 00 14 00	4,654 59	1 55
Hespeler	2,740	{ 18 128	{ 200 " s 100 " s	{ 18 00 13 00	1,831 80	67

STATEMENT "E"—Continued

Street Light Installation in Hydro Municipalities, December 31st, 1916, showing Cost per Year, Cost per Lamp, and Cost per Capita.

Municipality	Population	Number of Lamps	Size and Style of Lamps	Cost per Lamp	Total Cost	Cost per Capita
				\$ c.	\$ c.	\$ c.
Prescott.....	2,740	400	100-watt m	.....	2,500 00	90
Orangeville.....	2,493	{ 32 116	250 C.P. s 150 " s	15 00 12 00	.....	*
Listowel.....	2,326	{ 12 230	350-watt m 60 " m	.....	.....	*
Ridgetown	2,326	{ 17 130	200 " s 100 " s	37 00 18 00	2,969 00	1 27
Elmira	2,270	145	100 " m	12 00	1,740 00	77
Clinton	2,177	133	75 " s	12 50	1,650 00	76
Weston.....	2,156	{ 211 8 26 26	75 " s 5 lt. Stds. m York Tp. s Etobicoke Tp. s	12 00 40 00 16 00 15 00	3,692 00	† 30
Milton.....	2,072	203	100-watt m	11 00	2,013 20	97
Mimico	1,976	{ 152 61	100 " m 100 " m	11 00 16 00	2,496 75	† 84
Chesley	1,975	{ 81 16	100 " s 200 " s	13 00 .....	.....	*
Seaforth.....	1,964	{ 10 70 60	80 " s 80 " s 100 " s	13 00 12 00 15 00	1,869 96	95
Mount Forest	1,941	171	100 " s	12 00	1,963 00	1 01
Georgetown.....	1,905	{ 150 11	100 " m Glenwilliam m	11 00 12 00	1,724 17	† 83
Palmerston	1,843	103	100-watt s	15 00	1,542 33	84
Fergus	1,776	126	100 " m	12 50	1,575 00	88
Tilbury.	1,740	61	100 " m	15 00	938 73	54
Acton	1,735	{ 72 60	75 " s 100 " m	.....	1,497 50	86
Gravenhurst	1,702	{ 162 27	75 " s dock lights	.....	1,172 49	* 69
Mitchell	1,687	156	100-watt s	12 00	2,100 00	1 24
Durham	1,600	90	100 " s	12 00	1,068 00	67
Exeter	1,572	{ 23 150	250 " m 100 " m	27 00 14 06	.....	.....
New Hamburg ...	1,543	215	100 " m	8 50	1,827 00	1 18
Dresden	1,521	110	100 " s	15 00	1,650 00	1 08
Victoria Harbor..	1,477	60	100 " m	12 00	720 00	49
Blenheim	1,424	{ 13 133	300 " s 100 " s	36 50 15 50	2,536 00	1 78
Harriston... ..	1,404	61	75 " s	16 50	1,253 25	* 89
Pt. Dalhousie	1,318	85	100 " m	10 00	850 00	64
Caledonia	1,217	69	100 " m	12 00	760 00	62
Norwich.....	1,189	{ 15 45 53	400 " m 100 " m 60 " m	42 00 10 50 9 00	1,183 56	99

STATEMENT "E"—Continued

Street Light Installation in Hydro Municipalities, December 31st, 1916, showing Cost per Year, Cost per Lamp, and Cost per Capita.

Municipalities	Population	Number of Lamps	Size and Style of Lamps	Cost per Lamp	Total Cost	Cost per Capita
				\$ c.	\$ c.	\$ c.
New Toronto.....	1,186	{ 59 12	100-watt m 100 " m	12 00 } 15 00 }	838 00	71
Waterford	1,133	96	100 " m	14 00	1,174 82	1 03
Shelburne.	1,115	86	100 " s	12 00	.....	*
Elora	1,115	80	100 " m	12 50	1,000 00	90
Hagersville	1,105	100	100 " m	12 00	1,200 00	1 08
Winchester	1,065	113	100 " m	15 00	1,500 00	1 41
Pt. Credit	1,046	94	100 " m	11 00	1,033 00	99
Beaverton	1,015	71	100 " m	13 00	923 04	91
Markdale	989	65	100 " s	10 50	.....	*
Stayner	972	{ 51 15	60 " s 100 " s	9 00 } 12 00 }	609 00	63
Cannington	903	69	100 " m	12 00	831 96	92
Milverton	893	88	100 " m	12 50	.....	*
Dutton	870	95	100 " m	15 50	1,469 88	1 68
Port Stanley	849	{ 111 46	100 " m 100 " m	13 00 } 6 50 }	1,714 00	||
Chesterville	854	61	100 " m	13 00	798 00	93
Ayr	800	78	100 " m	14 00	1,092 00	1 35
Waterdown	785	59	100 " m	10 00	590 00	75
Thamesville. ...	769	70	100 " m	15 00	1,030 00	1 34*
Bolton	727	60	100 " m	15 00	893 75	1 23
Dundalk	721	62	100 " m	12 00	744 00	1 03
Bothwell	703	74	100 " m	15 50	1,186 06	1 68
Lucan	662	65	100 " m	15 00	979 50	1 48
Woodbridge	639	74	100 " m	13 00	963 00	1 51
Ailsa Craig	586	51	100 " m	15 50	819 62	1 40
Creemore	585	54	100 " m	16 00	874 58	1 50
Coldwater	579	44	100 " m	12 00	528 00	91
Wyoming	544	48	100 " m	16 50	.....	*
Embro	483	49	100 " m	14 00	685 10	1 42
Flesherton	428	44	150 " m	11 50	.....	*

STATEMENT "E"—Concluded

Street Light Installation in Hydro Municipalities, December 31st, 1916, showing Cost per Year, Cost per Lamp, and Cost per Capita.

Municipality	Population	Number of Lamps	Size and Style of Lamps	Cost per Lamp	Total Cost	Cost per Capita
				\$ c.	\$ c.	\$ c.
Woodville.....	388	33	100-watt m	13 00	423 44	1 09
Chatsworth.....	374	26	100 " m	12 00	325 00	87
Baden.....		62	100 " m	11 00	683 58	**
Brechin		9	100 " m	13 00	117 00	**
Beachville		42	100 " m	12 00	150 00	**
Burford		44	100 " m	13 00	572 00	**
Comber.....		42	100 " m	16 50	779 51	**
Drumbo		30	100 " m	14 00	420 00	**
Delaware ..		21	100 " m	14 00	241 50	**
Dorchester.....		27	100 " m	14 00	326 74	**
Elmvale		52	100 " m	12 00	624 00	**
Granton		32	100 " m	15 00	.....	**
Holstein		11	150 " m	15 50	.....	**
Lambeth		30	100 " m	14 00	420 00	**
Lynden.....		35	100 " m	12 00	360 00	**
Mount Brydges ..		38	100 " m	14 00	532 00	**
Otterville.....		19	100 " m	17 00	.....	**
Plattsville.....		32	100 " m	16 50	534 00	**
* Princeton.....		20	100 " m	17 00	340 00	**
Port McNicoll....		28	100 " m	12 00	336 00	**
Rockwood.....		41 5	100 " m 60 " }	11 00	506 00	**
Sunderland		21	100 " m	13 00	272 16	**
St. George.....		33	100 " m	15 00	495 00	**
Thorndale		21	100 " m	14 00	294 46	
Thamesford.....		34	100 " m	14 00	476 00	
Williamsburg		17	100 " m	13 00	220 67	**
Waubashene		29	100 " m	12 00	348 00	**

NOTE:—

m Multiple system.

s Series system.

* Not a full year.

† Rural revenue not included.

† \$5,210.54 Local Improvement debenture charges included.

|| On account of large summer population figures not representative.

** Population not recorded in Government statistics, so no figures used.

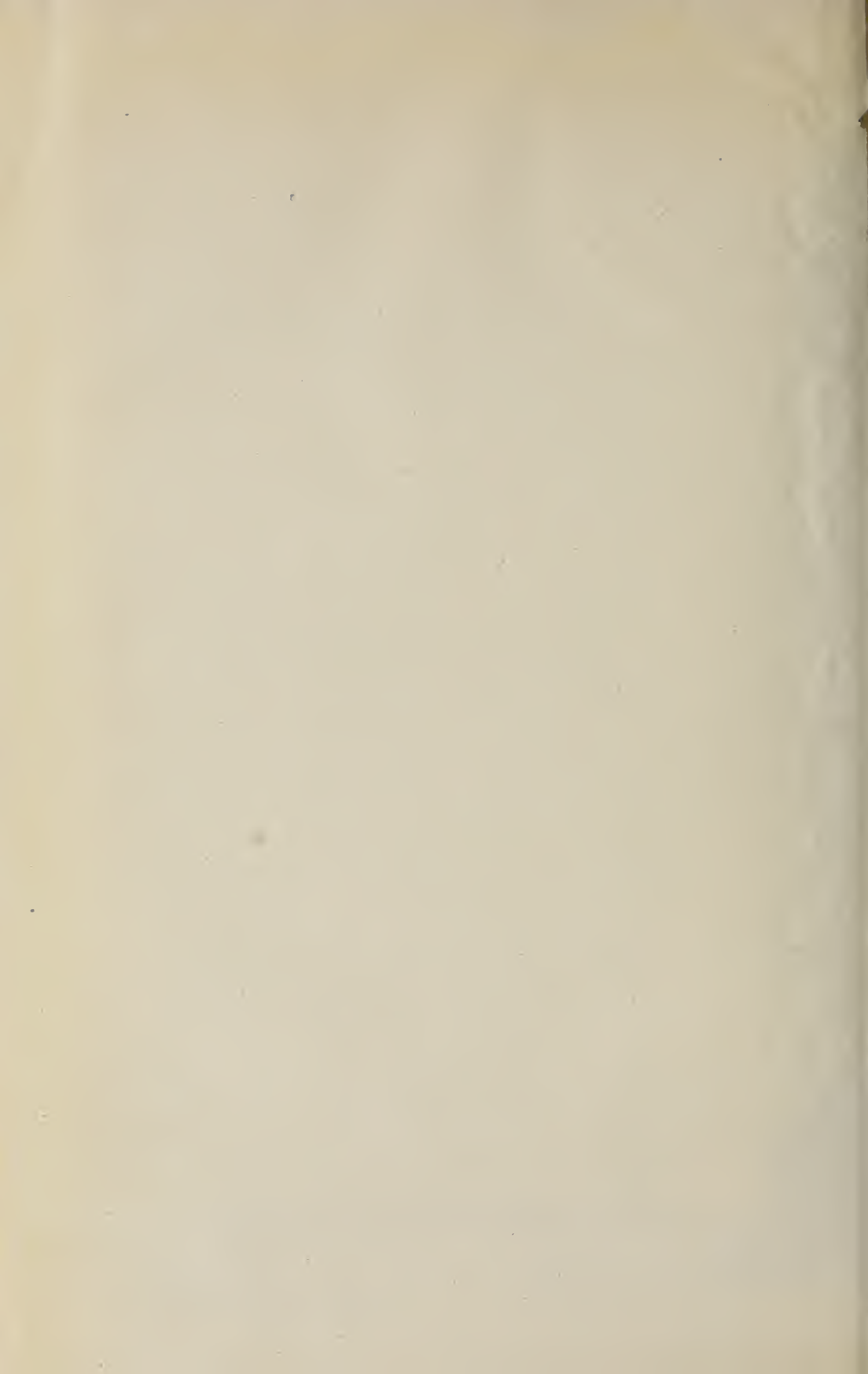
Power Rates in Municipalities

*Rate based on load characteristics and determined at end of year.
Note A—Power delivered at 26,400 or 22,000 volts.
Note B—Power delivered at 13,200 or 12,000 volts.
Note C—Power delivered at 6,600 volts.
Note D—Power delivered at 2,300 or 4,000 volts.

Lighting Rates in Municipalities

[illegible]

Note A—For all consumption up to 4 kw-hr. per month per 100 sq. ft. of floor area for the first 1000 sq. ft., and 3 kw-hr. for each additional 100 sq. ft. of floor area charged.
Note B—For all consumption up to 3 kw-hr. per month per 100 sq. ft. of floor area.



Ninth Annual Report
OF THE
HYDRO-ELECTRIC POWER
COMMISSION

OF THE
PROVINCE OF ONTARIO
FOR THE YEAR ENDED OCTOBER 31st
1916

VOLUME III.

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO:

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1917

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TORONTO

To His Honour, COLONEL SIR JOHN HENDRIE, K.C.M.G., C.V.O.,

Lieutenant-Governor of Ontario.

MAY IT PLEASE YOUR HONOUR:

The undersigned has the honour to present to Your Honour the third volume of the Ninth Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1916.

Respectfully submitted,

ADAM BECK,

Chairman.

TORONTO, ONT., February 17th, 1917.

COLONEL SIR ADAM BECK, K.B., LL.D.,

Chairman, Hydro-Electric Power Commission,

Toronto, Ont.

SIR,—I have the honour to transmit herewith the third volume of the Ninth Annual Report of the Hydro-Electric Power Commission of Ontario for the fiscal year ending October 31st, 1916.

I have the honour to be,

Sir,

Your obedient servant,

W. W. POPE,

Secretary.

HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

COLONEL SIR ADAM BECK, K.B., LL.D., London, Chairman.

HON. I. B. LUCAS, M.P.P., Markdale, Commissioner.

COLONEL W. K. McNAUGHT, C.M.G., Toronto, Commissioner.

W. W. POPE, Secretary.

F. A. GABY, Chief Engineer.

HYDRAULIC INVESTIGATIONS AND CONSTRUCTION

MEASUREMENT OF STREAM FLOW

The systematic measurement of stream flow was begun in 1912, and has been carried on continuously up to the present time.

This hydrometric study of the important rivers of the Province, though so far extending over a period of time too short to be really comprehensive, has nevertheless resulted in the accumulation of an appreciable amount of valuable data, and has provided an absolutely necessary basis of computation for the proper study of hydraulic development, river improvement, and flood prevention.

It is only by means of some governmental agency that information on stream flow can be adequately secured. The value of the data being directly proportional to the period of time over which it has been taken, the process is essentially continuous. No individual or private enterprise, therefore, possibly can carry on a work the utility of which is dependent solely upon the consistent accumulation and compilation of data over a continuous and long period of years.

The run-off from 47,000 square miles of watershed is now under continuous observation, but this is only about 12 per cent. of the total area of the basins within the boundaries of the Province, and the great number of enquiries received with reference to the flow of the rivers of Ontario, indicates not only that the Hydro-Electric Power Commission is becoming recognized as the source for dependable data of this kind, but also the necessity of increasing the scope of the work to cover a much greater territory within the Province than it does at present. In this connection it is especially necessary that the rivers flowing into James Bay and in the Lake Superior district be brought under observation, as the success of the large number of mining and pulp industries in this territory is absolutely dependent upon the power of the rivers, which cannot be gauged by any means other than the systematic study and recording of their flow.

During the year 1916, conditions did not permit of the addition of new stations, or even of the desired amount of work on those already established, and the rivers covered are practically the same as those of the previous year. The discharge curves, however, are better defined as a result of measurements secured at river stages not reached during previous years, and the accuracy of the daily flow estimates has been increased to a corresponding extent.

Many very valuable power sites are situated in uninhabited country often difficult of access, where river stages cannot be brought under continuous observation. In such cases the only information secured has consisted of intermittent flow measurements taken by the metering parties on the occasion of such visits as they were able to make.

As previously pointed out in the 1915 report, this report includes only the information that has been secured during the current water year, November 1st, 1915, to October 31st, 1916.

POWER AND STORAGE SURVEYS

Niagara Power Development.

During 1916 surveys were carried on continuously in connection with the gathering of the detailed information necessary for the design of the Chippawa-Queenston power plant. The initial surveys for this scheme are described in the report of the Commission for 1915.

These surveys have necessitated the use of a comparatively large field force of engineers, and have included the securing of the necessary topographical information, core drill explorations of the rock surface, and hydrometric data of the Welland and Niagara Rivers. The hydrometric information covered the continuous reading of water levels along the Niagara River at essential locations, the measurements of flow in the Welland River, and at its mouth, and the study of velocities and surface filaments in the Niagara River at Chippawa, and at the power house location at Smeaton's curve.

The office staff has been increased to transcribe the above information to the drawings, and to proceed with the design of the necessary structures. Good progress has been made on the studies of the best methods of construction for the work, and the preliminary designs are well advanced.

Nipissing Power Company.

The Nipissing Power Company, which was part of the assets of the Electric Power Company, taken over by the Provincial Government in May, 1916, is located on the South River near Powassan.

The natural flow of the stream must be augmented in the near future, by storage on its head waters. Studies were made during 1916, by the Commission on the possibilities of securing this storage at Cox's Chute, and designs of the necessary dams have been prepared.

The surge tank at present in use at the power plant is of wood construction, and has outlived its period of usefulness. During the summer surveys were made at the power house, and information collected for the design of a new tank. The necessary drawings for a new steel structure have been prepared and the Commission are now calling for tenders for its construction and erection.

Lac Seul Gauge

Readings are taken twice daily on the gauge attached to the wharf at the main post of the Hudson's Bay Company, at Lac Seul. Considerable difficulty was experienced with this gauge during the high water of 1916, owing to movement taking place in the elevation of the wharf, and corrections have been applied for dates between which the gauge zero was checked. These water elevations are not used in connection with stream flow measurements, but only to obtain the stage of the lake.

CROWN LEASES

Under the terms of Water-Power Leases issued by the Department of Lands, Forests and Mines, the plans and specifications covering the development of any power site owned by the Province, must be approved by the Commission, as a condition governing the issue of the lease. Two important matters were dealt with under this head during the past year.

The first was the development of the Mattagami Pulp and Paper Company at Smooth Rock Falls on the Mattagami River. This scheme involved the building of a large power plant and pulp mill at Smooth Rock Falls. This plant is under construction at the present time, in accordance with approved plans and specifications. Inspection of the works has been made from time to time.

The Abitibi Pulp and Paper Company, who have already a development at Iroquois Falls, submitted plans in August for a further power installation at Twin Falls on the Abitibi River. The plans involve the elimination of the Company's dam at Couchiching Falls, which controls the storage of Lake Abitibi. These plans for this development have been submitted for approval, and preliminary construction work is now in progress.

POWER CONSTRUCTION

SOUTH FALLS

The South Falls plant is located on the south branch of the Muskoka river. A resumé of the negotiations leading up to the acquisition of this plant from the Town of Gravenhurst was given in the report of the Commission for 1915, and the contemplated changes and additions to the plant were noted therein.

The work of extending the plant was commenced during September, 1915. A permanent road to the power house, and the subgrade for the wood-stave pipe were completed during the next six weeks. Cofferdams were put in for unwatering the head-works and tail race, the discharge water from old unit was diverted, and good progress made in the enlarging of tail race cut.

The excavation for the tail race and power house foundations was completed on January 10th, 1916. The first concrete in the power house was poured on January 11th, 1916, and the substructure was completed on March 27th, 1916. All of the above work was done by day labour, under the supervision of the Commission's engineers.

The power house superstructure was built under contract by Witchall & Son, of Toronto. Work was started on March 13th, and completed on May 27th, 1916.

The steel penstock, supplied by the Wm. Hamilton Company, of Peterboro, was delivered to the site in December, 1915, and the erection was completed on January 31st, 1916. The material for the wood-stave pipe, with the exception of sills and chocks, was supplied by the Pacific Coast Pipe Company; the erection being done by the Commission's working staff. The work of erection was started on April 4th, 1916, but owing to delays in delivery of sills, etc., was not finally completed until the end of June.

Some alterations had also to be made on the head works to accommodate the second pipe, this work being completed by April 4th, 1916.

The turbine, flywheel, butterfly valve, etc., supplied by the Wm. Hamilton Company, were delivered at South Falls, on June 28th, and the governor and relief valve on July 15th. These were erected in place and grouted in by July 24th, and the new unit was put on commercial load on August 25th, 1916.

The old unit was then shut down and the steel penstock emptied. Concrete saddles were built under it, earth and debris removed, and the pipe painted.

The wood-stave pipe is 946 feet long and 60 inches inside diameter, and is connected to the head works by means of a steel thimble 5 feet in diameter. The penstock at the lower end of the pipe is 64 feet long and 5 feet in diameter. It is

provided with a 48-inch diameter Tee connection for a future surge tank, and a 42-inch diameter cross-over connection to the old steel penstock in order that the capacity of the same may be increased when required.

The turbine is a 23-inch single runner horizontal Samson wheel in a cone-cylinder case, and is provided with a 3-ton, 60-inch diameter flywheel. The rated capacity is 1,060 mechanical horse-power at the generator coupling when operating at 102-foot head and 720 r.p.m. The unit is controlled by a Ludlow oil-pressure governor, and a governor-operated relief valve.

The turbine is direct connected to a 750 k.v.a., 60-cycle, three phase, 6,600-volt generator installed by the Canadian Westinghouse Company, of Hamilton, Ontario.

The capacity now installed in this plant, including the old unit, is about 1,500 electrical horse-power, and is now in continuous operation, supplying light and power to the municipalities of Gravenhurst and Huntsville.

COBDEN

A hydro-electric power plant of about 135 electric horse-power, was completed for the village of Cobden during 1916. The preliminary report and estimate covering this development was published in the report of the Commission for 1915. This plant is designed to carry the lighting load of the village, and a small 10-hour industrial load.

The designs for this plant were prepared, and the engineering work in general carried out by the Commission, on behalf of the municipality. The financing of the proposition was, however, a purely municipal undertaking, all costs being paid by the municipality.

The development scheme involved the construction of a storage dam at the outlet of Olmstead lake, from whence water is drawn through about 7 miles of natural channel to the pond at the original mill site, which is controlled by an old, but still serviceable stone and earth-fill dam. This old dam has been made part of the new development, and water is drawn from the pond through 200 feet of new head-race. After passing through a new concrete head-block, the water is carried to the wheels through a 30-inch wood-stave pipe.

The storage dam is a small earth-filled crib structure controlling about 96,000,000 cubic feet of water, this volume of storage being considered sufficient to meet the anticipated load requirements.

The power house is an entirely new structure throughout, and as the plant is situated about a mile from the village, it was provided with an upper residential storey, and a rear annex for the operator and his family, the whole being designed to combine practical utility with homelike architectural features. The foundations are of solid concrete, except for a portion where the stone foundations of the old mill were utilized. The lower storey of the main building is pressed brick, and the upper storey and annex is of wood with stained shingle trim and roof. The building contains eight residential rooms in addition to the machine room, which opens directly into the living-room.

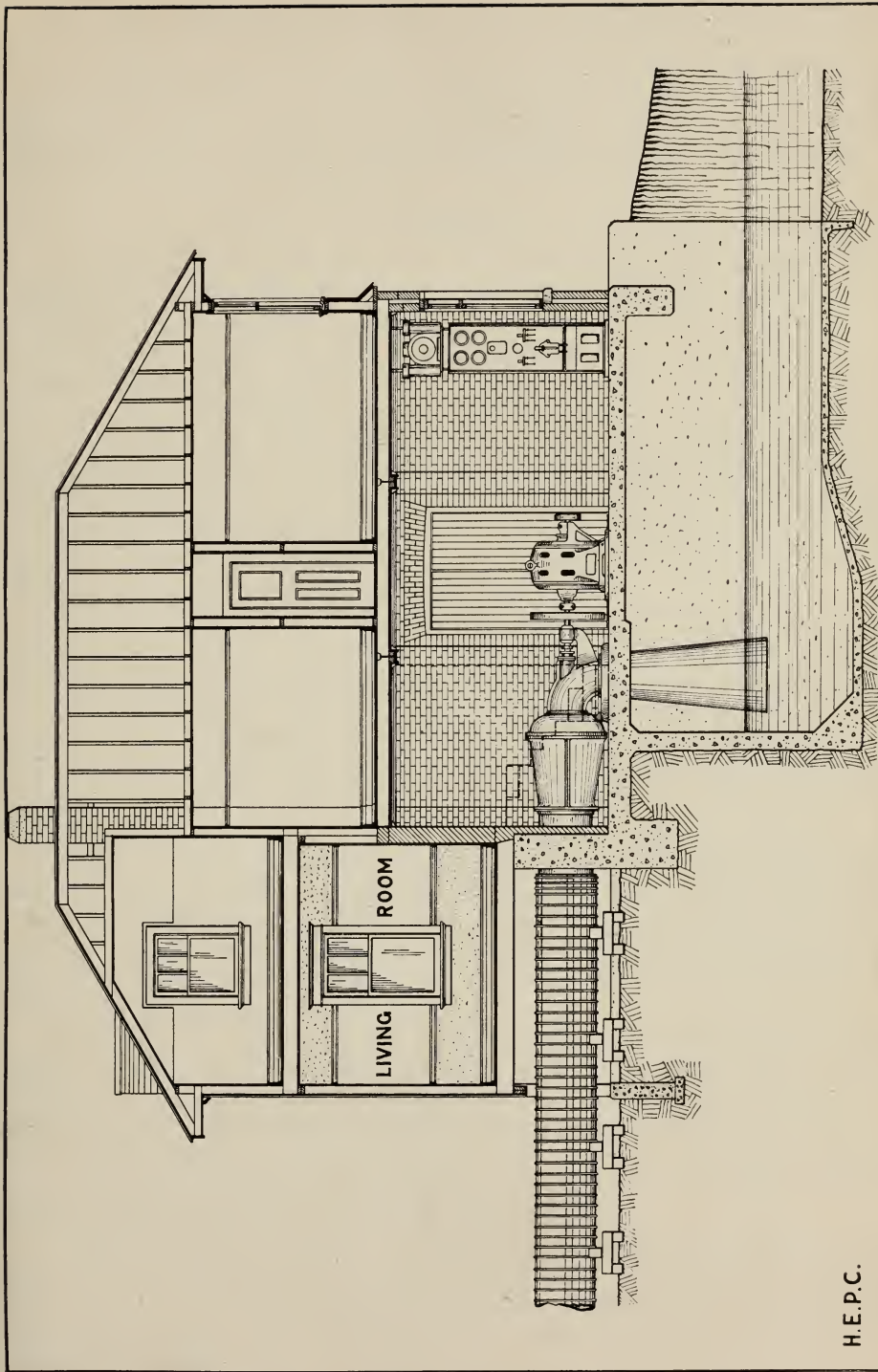
The machine installation consists of one Boving globe casing single runner turbine, of 160 H.P. capacity, running at 720 r.p.m., and provided with a fly-wheel coupling. Direct connected to the turbine is a Canadian General Electric Company generator, 3 phase, 60 cycle, 2,300 volts, and 100 k.v.a. capacity, with a belt driven exciter. The unit is controlled by a type "C" Woodward mechanical governor.



Cobden Development—Storage Dam at Olmstead Lake



Cobden Development—Combined Residence and Power House



H.E.P.C.

Sectional Elevation of Combined Power House and Residence

This plant was tested out and put in commercial operation on November 24th, 1916, and has been operating satisfactorily and continuously since that date.

The plant as originally designed did not include the operator's residence, but apart from the increase in cost, which this change involved, the work was completed within the original estimates, in spite of the high cost of labour and materials, which could not be reasonably anticipated when the estimates were prepared.

Almonte

In the spring of 1916, the Town of Almonte asked the Commission to investigate the possibilities of changing over their generating station and distribution system from direct to alternating current.

The station is located in the Town of Almonte on the Mississippi River, and operates under a 24-foot head.

A report on the hydraulic features involved, together with an estimate of the cost of changing over to alternating current was made in July. Following the recommendations made in this report, the town proceeded with the work of remodelling the plant under the direction of the engineers of the Commission.

The old equipment consisted of a pair of 42-inch diameter Barber turbines, horizontal setting, belt connected to a countershaft driving three-belted direct current generators of 130 k.w. total capacity.

The two wheels were originally coupled together with a flange coupling, but this coupling broke due to vibration in the setting, so that at the time of inspection the wheels were working independently, though belted to the same jack shaft.

It was decided to extend the turbine shaft through the power house wall and place a single new A.C. generator in a new building to be erected against the wall of the existing power house. This arrangement ensured a solid foundation for the generator, and placed the drive belt well away from any leakage or dampness from the turbine casing.

A pit for the drive pulley was excavated in rock and lined with concrete, and a concrete foundation constructed for the generator. A neat frame building 15 feet x 19 feet was erected, to house the generator and exciter, and a frame housing was built over the pulley pit and belt. The centre line of the generator was set eighteen feet five inches above, and nineteen feet over, from the centre line of the turbine shaft.

With this arrangement it was necessary to lengthen the turbine shaft six feet four inches, but as the drive was to be all from one end it was necessary to remove the old shaft from the near wheel, and replace it with a 5-inch shaft 19 feet 6 inches long. This new shaft was procured, the necessary key seats cut, and collars turned for thrust bearings. New thrust bearings were purchased, being standard bearings 4 15-16 inches x 15 inches with adjustable base plates, and babbitted to fit the thrust collars on the shaft.

When all was in readiness, the plant was shut down, the top of the wheel casing was dismantled and both shafts removed from the runners. One runner was taken to a local machine shop, where it was rebored to fit the new 5-inch shaft, and the end of the other shaft was turned and fitted to receive one-half of the jaw coupling.

The runner was then replaced and pressed onto the new shaft, and when the jaw coupling, new stuffing box and dome bushings had been placed, the shafts were lined up and the thrust bearings grouted.

New lignum vitae bearings were placed inside the casing, one on either side of the jaw coupling. These bearings were bolted to cast iron supports, resting on each side of the wooden wheel casing, and as the wet wood had proved to be far from rigid, new cast iron struts were placed so as to form knee braces from the bearings to the iron floor of the casing.

Owing to the bearings not being rigid, during the period of previous operation, the perimeter of the runners had become badly worn, causing considerable leakage. To remedy this a $\frac{3}{4}$ -inch x $1\frac{1}{2}$ -inch bar bent to the radius of the runner, was riveted to the inside of the cowl close up to the runner to ensure a more efficient water seal.

The thrust bearings were located near the outer edge of the new shaft, one on either side of the 58-inch drive pulley. This pulley, as also the 46-inch pulley on the generator shaft, is an iron centre wood rim split pulley with a 20-inch face.

The belt is 3-ply leather 20-inch x 69 feet 3 inches, and drives the new 250 k.w. 60-cycle, 2,200-volt, three-phase Westinghouse generator.

The plant has been operating quite satisfactorily since the change has been made.

STREAM FLOW DATA

Regular Stations

EASTERN ONTARIO DISTRICT

River	Location	Drain- age Area Sq. Miles	Township	County
Bonnechere	near Eganville	670	Wilberforce	Renfrew
“	near Golden Lake	575	South Algona	“
“	at Renfrew	910	Horton	“
Madawaska	at Flat Rapids	3,210	McNab	“
“	at Madawaska	800	Murchison	“
Mississippi	at Ferguson's Falls	1,042	Drummond	“
“	at Galetta	1,456	Fitzroy	Carleton
“	near Snow Road	446	Sherbrooke	Lanark
Moira	near Foxboro	1,038	Thurlow	Hastings
Napanee	near Napanee	300	Camden	Addington
Tay	near Glen Tay	204	Bathurst	Lanark
York	near Bancroft	374	Faraday	Hastings

Bonnechere River near Eganville

Location—400 feet downstream from McCrae’s Power Plant, and one mile from the Village of Eganville, near lot 16, concession 6, Township of Wilberforce, County of Renfrew.

Records Available—Discharge measurements from September, 1916. Gauge readings from September 24, 1915.

Drainage Area—670 square miles.

Gauge—Points on the rock bottom of the river from which direct readings are made to the water surface.

Channel and Control—The channel is slightly curved from the power house above and straight for ½ mile below the section. The bed of the river is shale, solid rock, and stones in some places. The banks are high, rocky and wooded, and not liable to overflow.

Discharge Measurements—Made by wading in section with the gauge at most stages, but frequently a few hundred yards further upstream at suitable low stages for better results.

Winter Flow—The relation between gauge heights and discharge is seriously disturbed during winter months, and estimates for that period are not more than fair.

Regulation—McCrae’s plant and dam is a short distance above the section, and there is another dam at Eganville, and one between. The flow is further regulated by the operation of the Round Lake Dam and the lumber dams on tributary streams.

Accuracy—Good for open channel measurements.

Observer—H. Welk, Eganville.

Discharge Measurements of Bonnechere River near Eganville in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 20....	West, C. W.	55	71	2.47	100.50	177	.....
Dec. 10....	“	53	74	2.13	100.71 (a)	157	.....
1916							
Jan. 27....	Campbell, L. L. .	53	96	2.43	101.83	233 (b)	.....
Mar. 30....	Campbell, L. L. .	.....	.....	.....	103.22	338 (c)	.....
“ 31....	“ .....	.....	.....	.....	103.22	337 (c)	.....
Apr. 14....	“ .....	.....	.....	.....	101.67	542 (c)	.....
May 22....	“ .....	.....	.....	.....	103.09	1,408 (c)	.....
June 16....	McLennan, C. C.	149	456	2.40	102.37	1,094 (d)	.....
July 11....	“	141	286	2.29	101.60	656	.....

(a) Ice along edges of control causes considerable effect at section.
(b) Section almost entirely ice covered.
(c) Weir measurement.
(d) Measurement below regular section.

Bonnechere River near Golden Lake

Location—At the highway bridge between Golden Lake Station and Village, in the Township of South Algona, County of Renfrew.

Records Available—Discharge measurements from June, 1915. Daily gauge heights from June 26, 1915.

Drainage Area—575 square miles.

Gauge—Elevations of water surface made by indirect readings from a point on the bridge, whose elevation is checked monthly.

Channel and Control—Bays exist above and below the section, the current being very slow up to the bridge. The flow is confined between the abutments of the bridge at all stages. The bed of the river is well protected by large boulders, and is not subject to change.

Winter Flow—Slightly affected by ice.

Regulation—The flow is regulated to the capacity of the Round Lake Dam for storage purposes, and the lumber industry has flood dams on some of the tributary waters.

Accuracy—Mean of daily readings give good results for stage readings. Calculations have been applied to compensate for dam effect in the spring and autumn of 1916.

Observer—Mary Sunstrum, Golden Lake.

Discharge Measurements of Bonnechere River near Golden Lake in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 22....	West, C. W.	108	238	.80	555.24	193 (a)	.....
Dec. 13....	" "	108	239	.64	555.21	153 (a)	.....
1916							
Jan. 29....	Campbell, L. L. .	110	273	.94	555.46	256 (a)	.....
Feb. 26....	McLennan, C. C.	112	316	1.10	555.99	347 (b)	.....
Mar. 24....	" "	112	304	1.01	555.82	306 (b)	.....
May 8....	" "	121	766	3.09	559.42	2,362 (c)	.....
" 9....	" "	121	722	3.74	559.31	2,700 (d)	.....
" 9....	" "	121	697	3.99	559.11	2,780 (e)	.....
" 10....	" "	121	686	3.89	559.01	2,670 (f)	.....
" 18....	" "	121	598	3.36	558.30	2,010 (f)	.....
" 20....	" "	121	586	3.24	558.24	1,900	.....
June 10....	Campbell, L. L. .	121	447	2.41	557.19	1,078	.....
July 13....	" "	117	373	1.73	556.43	647	.....
Sept. 9....	McLennan, C. C.	112	325	1.06	555.91	346	.....
" 9....	" "	126	209	1.65	555.90	344	.....
Oct. 30....	Campbell L. L. .	109	303	.40	555.69	121 (g)	.....

(a) Ice on lake, section free.

(b) Dam in course of construction just below control.

(c) Dam influence—high swell on lake.

(d) Dam influence—part spillway gone.

(e) Dam influence—all spillway gone.

(f) Dam influence.

(g) New dam under construction.

Drainage Area 575 Square Miles

[illegible]

Monthly Discharge of Bonnechere River near Golden Lake for 1915-6

Drainage Area, 575 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	170	107	139	.30	.19	.24	.27
December ..	180	138	153	.31	.24	.27	.31
January .. (1916)	259	175	194	.45	.30	.34	.39
February	384	259	303	.67	.45	.52	.56
March	422	305	338	.73	.52	.59	.68
April	2,640	190	1,611	4.59	.33	2.80	3.12
May	2,780	1,470	2,050	4.83	2.56	3.57	4.12
June 26-30	1,440	545	934	2.50	.95	1.62	1.81
July	650	378	521	1.13	.66	.91	1.05
August	378	195	274	.66	.34	.48	.55
September	440	215	297	.77	.37	.52	.58
October	299	208	249	.52	.36	.43	.50
The year	2,780	107	588	4.83	.19	1.02	13.88

Bonnechere River at Renfrew

- Location**—One-half mile below Raglan St., Town of Renfrew, Township of Horton, County of Renfrew, on the Barnett Estate.
- Records Available**—Discharge measurements from September, 1916. Daily gauge readings from November 1, 1916.
- Drainage Area**—910 square miles.
- Gauge**—On the right bank of the river at the section, a box chain gauge with nine feet of standard gauge plates. Distance from end of weight to marker is 12.43 feet.
- Channel and Control**—The channel is straight for 100 feet above and 300 feet below the station, but both above and below the station long sharp curves occur. There is a high clay bank on the right, and a low clay bank on the left. At extreme high water there may be an escape from this channel of some water from higher above the section to points below the section. The bed of the stream is composed of clean small stones.
- Winter Flow**—Little ice effect expected, though on occasions frazil ice from the rapids above may make meter measurements difficult.
- Regulation**—The Round Lake Dam, the Golden Lake Dam for power purposes, and the dams on the upper river for lumbering purposes have large regulating effects on this river. The power plants in Renfrew, running twenty-four hours to their full capacity, and having little pondage, will not seriously affect the estimate of mean gauge heights.
- Observer**—William Collie, 88 Bank St., Renfrew.

Discharge Measurements of Bonnechere River at Renfrew for 1916

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916							
Sept. 11....	McLennan, C. C.	83	170	2.09	103.13	356	.....
“ 11....	“	83	171	2.11	103.13	361	.....
Oct. 26....	“	81	134	1.90	102.81	254	.....

Madawaska River at Flat Rapids

Location—Near lot 7, concession 9, Township of McNab, County of Renfrew, half mile below Flat Rapids.

Records Available—High-water measurements during 1915 and 1916 to be used in conjunction with low-water measurements at this section for application to gauge readings taken at Claybank by the Ottawa River Storage Survey, from April 15, 1909. Discharge measurements commenced in October, 1916, at this section, and September, 1915, at high-water section.

Drainage Area—3,210 square miles.

Gauge—Nine feet of standard gauge plates on the boom crib 1,000 feet below the Claybank bridge, about 1,500 feet below the high water section, and 3 miles below the low water section.

Channel and Control—Channel is straight for 3,000 feet above and 500 feet below the station and favorably fast current exists for metering purposes. Clay and gravel banks, high on the right bank, medium, to low on the left bank, but the river is not liable to overflow. The flow is through one channel at high and low stages and through two channels at medium stages. Possibly frazil ice may be expected on some days.

Discharge Measurements—From boat and ice.

Winter Flow—Gauge height discharge relation will be considerably affected by ice, but likely to be capable of close estimation from discharge measurements.

Regulation—There are no powers developed on the river as yet, though construction has started on one at the foot of Calabogie Lake, which will have considerable regulating effect on the river below, but possibly not acting rapidly enough to disturb the gauge height discharge daily estimate. The storage works for lumbering purposes on the upper river and its tributaries are still in use.

Observer—Narcisse Jandreau, R. R. Arnprior.

Discharge Measurements of Madawaska River at Claybank in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 25....	West, C. W.	322	4,696	.32	260.54	1,485	.....
Dec. 17....	"	316	4,543	.27	260.59	1,235 (a)	.....
1916							
Jan. 24....	Campbell, L. L..	318	4,283	.39	260.88	1,669 (a)	.....
Feb. 12....	McLennan, C. C..	324	4,484	.66	260.79	2,954 (a)	.....
Apr. 19....	Campbell, L. L..	348	6,584	2.08	265.96	13,694	.....
May 23....	"	344	5,962	1.70	264.29	10,125	.....
June 14....	McLennan, C. C..	337	5,520	1.31	262.92	7,255	.....
July 10....	"	331	5,083	.73	261.83	3,701	.....
Oct. 12....	Campbell, L. L..	230	2,085	.56	260.29	1,176	.....

(a) Ice measurement.

Madawaska River at Madawaska

Location—50 feet above the G.T. Ry. bridge, Canada Atlantic branch, 500 yards east of the Madawaska Station, Township of Murchison, District of Nipissing.

Records Available—Discharge measurements from September, 1915, and monthly thereafter, and gauge readings from September 27, 1915.

Drainage Area—800 square miles.

Gauge—Three feet of standard gauge plates secured vertically to pile, three feet west of face of east abutment.

Channel and Control—Channel is straight for about 400 feet above the section, curving slightly to the right under the bridge. The banks are sandy, and not liable to overflow. The bed of the river is soft, and there are some weeds above the section. The point of control is not clearly defined.

Discharge Measurements—Made about fifty feet above gauge from a boat.

Winter Flow—Affected by ice conditions.

Regulation—Lumber interests on the river above the section operate dams for driving purposes.

Accuracy—Open water rating curve for ordinary stages likely to be very good.

Observer—G. Wormke, Madawaska.

Discharge Measurements of Madawaska River at Madawaska in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 22....	West, C. W.	75	461	.55	101.75	253 (a)	.....
Dec. 13....	..	75	421	.57	101.69	238 (b)	.....
1916							
Jan. 31....	Campbell, L. L. .	70	520	1.21	104.92	633 (b)	.....
Feb. 28....	McLennan, C. C. .	78	487	.92	104.33	446 (b)	.....
Mar. 25....	..	75	409	.68	103.50	279 (b)	.....
Apr. 17....	Campbell, L. L. .	104	1,180	2.15	109.30	2,531	.....
May 20....	McLennan, C. C..	102	1,129	1.89	108.89	2,132	.....
June 16....	Campbell, L. L. .	86	644	.96	104.00	620	.....
July 13....	..	81	563	.80	103.07	449	.....
Sept. 9....	McLennan, C. C..	76	474	.46	101.60	216 (c)	.....
Oct. 27....	Campbell, L. L. .	79	498	.54	102.25	267	.....

- (a) Weeds may effect, ice on both edges of section.
- (b) Ice measurement.
- (c) Weeds near left bank caused very irregular flow.

Monthly Discharge of Madawaska River at Madawaska for 1915-6

Drainage area 800 square miles

Month.	Discharge in Second-feet.			Discharge in Second-feet. per square mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	525	237	287	.66	.30	.36	.40
December.....	525	213	285	.66	.27	.36	.42
January .. (1916)	635	276	371	.79	.34	.46	.53
February	770	434	581	.96	.54	.73	.79
March.....	1,160	279	425	1.45	.35	.53	.61
April.....	4,430	915	2,333	5.54	1.14	2.92	3.26
May.....	3,280	1,290	1,985	4.10	1.61	2.48	2.86
June	1,220	555	784	1.52	.69	.98	1.09
July.....	630	238	437	.78	.30	.55	.63
August.....	253	199	228	.32	.25	.29	.33
September.....	269	184	205	.34	.23	.26	.29
October	392	164	242	.49	.20	.30	.35
The year	4,430	164	679	5.54	.20	.85	11.57

Mississippi River at Ferguson's Falls

Location—At the highway on the road through the Village of Ferguson's Falls, near lots 16 and 17, concession 12, Township of Drummond, County of Lanark.

Records Available—Discharge measurements from July, 1915, and gauge readings from July 13, 1915.

Drainage Area—1,042 square miles.

Gauge—0 to 6 feet of standard gauge plates secured to the inner face of the first pier
*from the south end of the bridge and near the downstream corner of the pier.

Channel and Control—Channel is straight for 300 feet above and $\frac{1}{2}$ mile below the gauging station. The banks are not liable to overflow. There are 7 channels, formed by the piers of the bridge. The present control is a short distance below the section, and ice action there will affect the discharge relation at low winter stages, but this will not be the point of control for high-water stages. At certain stages measurements are made 1,500 feet below bridge.

Winter Flow—Discharge relation will be affected by ice.

Regulation—The river is regulated throughout its length by power and storage dams, as well as dams in connection with the timber industry.

Accuracy—Open flow relation will be good.

Observer—A. M. Sheppard, Ferguson's Falls.

Discharge Measurements of Mississippi River at Ferguson's Falls in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 9....	West, C. W	187	233	1.74	101.25	406	.....
Dec. 1....	"	189	255	1.97	101.40	502	.....
1916							
Jan. 11....	"	168	248	2.00	101.50	496 (a)	.....
Feb. 8....	McLennan, C. C..	198	442	3.58	102.29	1,581 (b)	.....
Apr. 12....	" ..	211	772	5.93	103.88	4,579	.....
May 25....	" ..	211	693	5.56	103.46	3,857	.....
June 20....	" ..	211	733	5.77	103.71	4,225	.....
Sept. 28....	" ..	210	195	1.59	101.12	310 (c)	.....
" 28....	" ..	172	201	1.68	101.14	339	.....

(a) Ice above section and at piers.

(b) Ice covered above and below section.

(c) Metering taken 600 ft. below regular section.

Daily Gauge Height and Discharge of Mississippi River at Ferguson's Falls for 1915-6
Drainage Area, 1,042 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	101.27	419	101.39	510	101.35	478	102.25	1380	101.81	555	103.12	3150	104.10	4980	103.10	3110	103.19	3270	101.83	945	101.25	405	101.13	328
2	101.28	426	101.39	510	101.38	500	102.45	1740	101.78	630	103.50	3860	104.03	4850	103.08	3070	103.13	3160	101.81	920	101.25	405	101.10	310
3	101.27	419	101.38	500	101.38	500	102.49	1850	101.80	565	103.03	4480	104.00	4790	103.05	3020	103.11	3130	101.78	890	101.25	405	101.08	298
4	101.26	412	101.35	478	101.42	530	102.50	1830	101.78	485	104.10	4980	103.97	4740	103.02	2960	103.08	3070	101.75	855	101.25	405	101.08	298
5	101.24	398	101.35	478	101.43	540	102.46	1750	101.76	470	104.25	5270	103.88	4570	102.97	2360	103.08	3070	101.72	820	101.25	405	101.08	298
6	101.25	405	101.34	470	101.42	530	102.41	1660	101.79	492	104.29	5340	103.83	4480	102.93	2790	103.06	3030	101.68	780	101.25	405	101.08	298
7	101.25	405	101.33	462	101.42	492	102.35	1560	101.77	470	104.23	5230	103.78	4380	102.85	2630	102.99	2900	101.67	770	101.26	410	101.08	298
8	101.23	391	101.33	462	101.42	470	102.33	1520	101.75	455	104.17	5110	103.67	4170	102.83	2600	102.95	2820	101.67	770	101.32	455	101.06	286
9	101.23	391	101.35	478	101.42	450	102.31	1470	101.75	448	104.06	4900	103.52	3900	102.83	2600	102.93	2790	101.67	770	101.36	485	101.07	292
10	101.23	391	101.48	585	101.45	462	102.33	1410	101.75	419	103.98	4750	102.48	3820	102.83	2600	102.83	2600	101.66	760	101.38	500	101.11	316
11	101.23	391	101.38	500	101.49	462	102.21	1300	101.78	426	103.94	4680	102.38	3630	102.86	2650	102.73	2420	101.62	720	101.33	472	101.13	328
12	101.20	370	101.32	455	101.49	478	102.18	1230	101.76	338	103.88	4570	102.27	3420	102.94	2810	102.65	2270	101.59	690	101.30	440	101.18	358
13	101.21	377	101.29	433	101.54	510	102.18	1230	101.75	426	103.94	4680	102.15	3200	102.98	2890	102.54	2060	101.57	670	101.26	412	101.20	370
14	101.20	370	101.31	448	101.57	530	102.19	1290	101.75	455	104.04	4870	102.08	3070	102.98	2890	102.44	1870	101.54	640	101.24	398	101.21	377
15	101.20	370	101.38	500	101.58	550	102.11	1140	101.78	500	104.15	5080	103.00	2920	102.98	2890	102.39	1770	101.51	610	101.25	405	101.21	377
16	101.21	377	101.33	462	101.58	560	102.06	1070	101.76	515	104.27	5300	102.96	2840	103.00	2920	102.34	1680	101.47	575	101.22	384	101.23	391
17	101.21	377	101.31	448	101.61	585	101.96	935	101.78	585	104.35	5450	103.12	3150	103.10	3110	102.32	1650	101.43	540	101.18	358	101.33	462
18	101.19	364	101.33	462	101.63	620	101.92	890	101.80	600	104.45	5630	103.29	3460	103.26	3400	102.28	1570	101.40	515	101.17	352	101.28	426
19	101.21	377	101.32	455	101.67	640	101.93	910	101.78	620	104.52	5770	103.52	3900	103.46	3780	102.26	1540	101.32	455	101.17	352	101.25	405
20	101.29	433	101.29	433	101.66	650	101.97	935	101.81	660	104.54	5810	103.65	4130	103.66	4150	102.21	1460	101.28	425	101.17	352	101.30	440
21	101.34	470	101.33	462	101.67	650	101.98	945	101.79	660	104.52	5770	103.71	4250	103.80	4420	102.16	1380	101.25	405	101.17	352	101.31	448
22	101.33	462	101.31	448	101.78	770	101.90	820	101.79	720	104.48	5690	103.71	4250	103.91	4630	102.12	1320	101.25	405	101.17	352	101.31	448
23	101.33	462	101.30	440	101.85	845	101.83	750	101.84	780	104.46	5650	103.65	4130	103.92	4650	102.09	1280	101.25	405	101.15	340	101.31	448
24	101.33	462	101.29	433	101.88	865	101.81	740	101.83	810	104.46	5650	103.56	3970	103.90	4610	102.06	1230	101.25	405	101.15	340	101.30	440
25	101.33	462	101.32	455	101.90	910	101.80	700	101.83	875	104.46	5650	103.46	3780	103.79	4400	102.03	1190	101.25	405	101.15	340	101.26	412
26	101.35	478	101.33	455	101.96	995	101.79	585	101.83	890	104.42	5580	103.29	3460	103.64	4120	102.00	1150	101.25	405	101.15	340	101.30	440
27	101.38	500	101.33	462	102.02	1070	101.50	590	101.89	995	104.40	5540	102.20	3290	103.54	3940	101.98	1130	101.25	405	101.14	334	101.26	412
28	101.36	485	101.34	470	102.10	1160	101.83	630	101.94	1080	104.35	5450	103.16	3220	103.49	3820	101.97	1110	101.25	405	101.12	322	101.26	412
29	101.36	485	101.33	462	102.17	1250	101.83	610	102.09	1280	104.27	5300	103.11	3130	103.34	3560	101.93	1070	101.25	405	101.17	352	101.22	384
30	101.41	525	101.34	470	102.17	1260	.....	.....	102.40	1790	104.19	5160	103.09	2990	103.27	3420	101.89	1020	101.25	405	101.16	346	101.20	370
31	.....	.....	101.35	478	102.19	1300	.....	.....	102.75	2450	.....	.....	103.12	3150	103.27	....	101.84	960	101.25	405	.....	.....	101.17	352

Monthly Discharge of Mississippi River at Ferguson's Falls for 1915-6

Drainage Area 1,042 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November.(1915)	525	364	422	.50	.35	.40	.45
December "	585	433	470	.56	.42	.45	.52
January...(1916)	1,300	455	697	1.25	.44	.67	.77
February.....	1,850	585	1,154	1.78	.56	1.11	1.20
March.....	2,450	398	726	2.35	.38	.70	.81
April.....	5,810	3,150	5,145	5.58	3.62	4.94	5.51
May.....	4,980	2,840	3,807	4.78	2.73	3.65	4.21
June	4,650	2,600	3,377	4.46	2.50	3.24	3.61
July	3,270	960	1,967	3.14	.92	1.89	2.18
August.....	945	405	599	.91	.39	.57	.66
September.....	500	322	387	.48	.31	.37	.41
October.....	462	286	371	.44	.27	.36	.42
The year	5,810	286	1,588	5.58	.27	1.52	20.69

Mississippi River at Galetta

Location—In the Village of Galetta, Township of Fitzroy, County of Carleton, about one hundred feet above, and parallel to the highway bridge over the river. It is only a few hundred yards below the dam and power house of the Galetta Power & Milling Company.

Records Available—Discharge measurements from June, 1915, and gauge readings twice daily from June 24, 1915.

Drainage Area—1,456 square miles.

Gauge—0 to 9 feet of standard gauge plates secured to the left abutment of the highway bridge. High stages measured by rule from gauge.

Channel and Control—Channel is straight for 200 feet above and below the section to a little rapid. The river bed is composed of gravel and stones, with solid rock on the right bank and gravel on the left bank. The point of control is through a solid rock formation a hundred and fifty yards below the section.

Discharge Measurements—Made by wading and from a boat held up to tag line by cable. Extreme high-water measurements have to be made from the highway bridge.

Winter Flow—The winter conditions here will not seriously affect the gauge height and discharge relations.

Regulation—The river is subject to regulation throughout its entire length. In the headwaters are storage dams for power purposes, as well as timber dams for driving purposes.

Accuracy—Owing to the wet season the wasted water has been considerably more than would usually be the case. This season's relations between gauge height and discharge are likely better than those of the ordinary year.

Co-operation—Discharge measurements made at the bridge by the Department of Public Works of Canada.

Observer—J. P. Coyne, Galetta.

Discharge Measurements of Mississippi River at Galetta in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 24....	West, C. W.	88	140	3.44	244.47	481	.....
Dec. 9....	“	90	148	3.42	244.47	508 (a)	.....
1916							
Jan. 24....	Campbell, L. L. .	60	196	4.60	245.49	902 (b)	.....
Feb. 21....	McLennan, C. C.	96	300	3.45	246.05	1,034 (c)	.....
Mar. 20....	“	100	222	3.00	245.24	667 (d)	.....
April 19....	Campbell, L. L. .	.....	.....	.....	252.07	5,656	.....
May 22....	“ .....	.....	.....	.....	250.82	3,961	.....
June 14....	McLennan, C. C.	102	902	2.62	248.82	2,363	.....
July 10....	“	101	894	3.26	248.86	2,333	.....
Sept. 7....	“	68	131	3.34	244.28	437	.....
Oct. 24....	Campbell, L. L. .	75	150	3.47	244.55	519	.....

(a) Ice at gauge.
(b) Ice at left edge of section.
(c) Ice at edges of section.
(d) Ice at edges of section and control.

3 H (iii)

Monthly Discharge of Mississippi River at Galetta for 1915-6

Drainage Area, 1,456 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	555	345	428	.38	.24	.29	.32
December	565	425	504	.39	.29	.35	.40
January (1916)	1,490	471	786	1.02	.32	.54	.62
February	1,960	865	1,291	1.35	.59	.89	.96
March	3,680	670	973	2.53	.46	.67	.76
April	6,730	4,380	5,563	4.62	3.01	3.82	4.26
May	4,900	2,730	3,604	3.37	1.88	2.48	2.86
June	3,280	2,310	2,743	2.25	1.59	1.88	2.10
July	3,040	940	1,891	2.09	.65	1.30	1.50
August	935	338	641	.64	.23	.44	.51
September	494	296	402	.34	.20	.28	.31
October	615	235	398	.42	.16	.27	.31
The year	6,730	235	1,596	4.62	.16	1.10	14.97

Mississippi River near Snow Road

Location—At the highway bridge about two miles below the Village of Snow Road, Township of Sherbrooke, County of Lanark.

Records Available—Discharge measurements from July, 1915, and gauge readings on week days since July 30, 1915.

Drainage Area—496 square miles.

Gauge—0 to 6 ft. of standard gauge plates secured vertically to the downstream side of the left abutment of the highway bridge. The elevation of the zero on gauge is assumed as 100.00.

Channel and Control—The channel approaches and leaves the section at a slight angle. The banks are high, and are not liable to overflow. The bridge pier forms two channels at the gauging section. Earth, rocks and gravel in the river bed, not shifting. Control for ordinary stages not well defined. At very high water stages the point of control is probably the head of the rapids just above High Falls.

Discharge Measurements—Measurements made from bridge at all stages.

Winter Flow—Discharge relation affected by ice.

Regulation—The power and lumber companies operating on this river have storage dams above this point.

Accuracy—No Sunday readings have been secured by gauge-readers, but the fluctuation in stage is slow. The open-water relation should be good.

Observer—Fred. Jackson, Snow Road.

Discharge Measurements of Mississippi River near Snow Road in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 23....	West, C. W.....	58	322	.90	102.10	291	.....
Dec. 16....	"	58	320	.99	102.02	317 (a)	.....
1916							
Feb. 1....	Campeell, L. L. .	58	380	1.59	103.00	605 (b)	.....
" 23....	McLennan, C. C..	58	309	1.21	102.58	374 (c)	.....
Mar. 21....	"	58	307	1.17	102.92	361 (c)	.....
Apr. 8....	"	58	443	2.80	104.17	1,239	.....
June 28....	"	58	496	3.80	105.00	1,885	.....
July 14....	Campbell, L. L. .	58	426	2.35	103.75	1,000	.....
Sept. 12....	"	58	318	1.00	102.17	316	.....
Oct. 1....	"	58	300	.69	101.92	208	.....

(a) Ice on ponds above and below section.

(b) Ice on ponds above and below section. Section partly ice covered.

(c) Ice measurement.

Monthly Discharge of Mississippi River near Snow Road for 1915-6

Drainage Area, 446 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	288	214	253	.65	.48	.57	.64
December "	307	282	292	.69	.63	.65	.75
January ..(1916)	560	302	360	1.26	.68	.81	.93
February	605	359	427	1.36	.80	.96	1.04
March	1,030	350	405	2.31	.78	.91	1.02
April	2,940	1,220	2,183	6.59	2.74	4.89	5.46
May	2,720	1,220	1,712	6.10	2.74	3.84	4.43
June	2,560	1,110	1,663	5.74	2.49	3.73	4.16
July	1,640	600	1,051	3.68	1.35	2.36	2.72
August	625	265	419	1.40	.59	.94	1.08
September	329	245	286	.74	.55	.64	.71
October	356	229	278	.80	.51	.62	.71
The year	2,940	214	776	6.59	.48	1.74	23.68

Moira River near Foxboro

Location—Three hundred feet above G.T.R. Crossing, and six hundred feet east of Foxboro Station, on the G.T.R.-Belleville, Peterboro Branch. Near Lot 5, Concession VI, Township of Thurlow, County of Hastings.

Records Available—Monthly discharge measurements from September, 1915, and gauge readings from October 12, 1915.

Drainage Area—1,038 square miles.

Gauge—Four points on the bed of the river, about 50 feet above the section have been selected from which the elevation of the water surface is measured twice daily. One of these points is used at a time, according to the stage of the river.

Channel and Control—At one side of the river at the section are boulders and rocks, but the rest of the section is smooth, solid rock, liable to no movement at all. The control is only a few feet below the section and is not likely to freeze over in winter except for short periods of time.

Discharge Measurements—At ordinary stages the measurements are made by wading, at tag line.

Winter Flow—The relation of gauge height to discharge will be but slightly affected by ice, but likely in a fairly uniform manner throughout the winter.

Regulation—The river above the section has dams in many places besides the regulation for the lumber interest, on different tributary lakes and streams.

Accuracy—Open water relation will be good.

Observer—C. Stewart, Foxboro P.O.

Discharge Measurements of Moira River near Foxboro in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 13....	West, C. W.....	163	192	1.13	321.95	217	.....
Dec. 4....	“	166	323	2.52	322.75	816 (a)	.....
1916							
Jan. 5....	“	164	273	1.75	322.46	478 (a)	.....
Feb. 12....	McLennan, C. C..	178	507	2.96	323.93	1,500 (a)	.....
Mar. 10....	“ ..	162	297	2.25	322.68	669	.....
May 8....	“ ..	181	505	4.10	324.05	2,073	.....
June 27....	Campbell, L. L ..	190	973	5.87	325.17	3,952	.....
July 26....	“ ..	164	268	1.80	322.47	482	.....
Sept. 19....	“ ..	120	126	.95	321.66	121	.....
Oct. 12....	“ ..	115	107	.67	321.50	72	.....

(a) Ice covered above section.

Daily Gauge Height and Discharge of Moira River near Foxboro for 1915-6

Drainage Area, 1,038 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	322.01	264	322.89	730	322.44	464	325.32	4200	322.84	695	326.69	6510	325.02	3700	324.37	2610	324.50	2830	322.27	382	321.79	174	321.60	105
2	321.97	246	322.81	720	322.44	464	325.55	4560	322.84	695	327.09	7180	324.90	3500	324.39	2640	324.35	2570	322.20	349	321.79	174	321.60	105
3	321.99	254	322.87	700	322.46	475	325.54	4580	322.83	690	327.34	7610	324.82	3360	324.52	2860	324.26	2430	322.18	340	321.77	167	321.58	98
4	321.99	254	322.77	655	322.42	454	325.37	4290	322.77	655	327.59	8020	324.77	3290	324.60	3000	324.21	2550	322.16	331	321.76	164	321.56	92
5	322.01	264	322.73	630	322.48	485	325.20	4010	322.74	8360	324.74	3240	324.66	3100	324.58	2970	324.13	2210	322.10	304	321.76	164	321.54	85
6	322.00	250	322.69	605	322.54	519	324.98	3630	322.67	500	327.79	8360	324.66	3100	324.58	2970	324.13	2060	322.10	304	321.74	163	321.52	79
7	321.98	251	322.65	580	322.56	519	324.75	3250	322.68	600	327.49	7850	324.59	2980	324.51	2850	323.89	1820	322.08	295	321.73	151	321.54	85
8	321.98	251	322.61	555	322.56	530	324.43	2710	322.70	610	327.04	7100	324.47	2780	324.45	2740	323.80	1690	322.16	331	321.79	174	321.54	85
9	321.97	246	322.59	545	322.54	519	324.36	2590	322.66	585	326.29	5830	324.36	2590	324.39	2640	323.82	1450	322.16	331	321.78	170	321.55	88
10	321.98	251	322.48	485	322.59	545	324.18	2290	322.66	585	326.10	5540	324.25	2410	324.39	2640	323.48	1290	322.14	322	321.74	163	321.54	85
11	321.98	251	322.48	485	322.62	560	324.00	1990	322.65	580	325.90	5180	324.14	2230	324.41	2680	323.58	1400	322.12	313	321.73	151	321.54	85
12	321.96	242	322.44	464	322.61	555	323.89	1830	322.62	565	325.79	4990	324.07	2110	324.48	2800	323.48	1290	322.10	304	321.71	144	321.54	85
13	321.97	246	322.39	439	322.73	630	323.73	1590	322.63	570	325.73	4900	323.98	1960	324.63	3050	323.38	1180	322.08	295	321.68	133	321.58	98
14	321.97	246	322.39	439	322.75	640	323.73	1590	322.62	565	325.78	4980	323.83	1730	324.71	3190	323.29	1080	322.05	281	321.68	133	321.56	92
15	321.97	246	322.66	585	322.79	665	323.65	1490	322.63	570	326.06	5450	323.75	1620	324.70	3170	323.24	1040	322.03	272	321.70	140	321.54	85
16	322.01	264	322.33	410	322.83	690	323.52	1330	322.60	550	326.18	5660	323.64	1480	324.90	3500	322.91	750	321.98	250	321.68	133	321.58	98
17	321.99	254	322.31	401	322.85	705	323.45	1260	322.60	550	326.24	5760	323.78	1660	325.52	4540	322.93	765	321.97	246	321.68	133	321.54	85
18	321.99	254	322.37	430	322.89	730	323.39	1190	322.57	555	323.27	5810	323.94	1000	325.91	5200	322.85	705	321.96	242	321.68	133	321.55	88
19	322.08	295	322.35	420	322.96	800	323.20	1000	322.59	545	323.27	5620	324.15	2240	326.31	5870	322.80	670	321.96	242	321.66	126	321.62	112
20	322.31	401	322.37	430	322.92	755	323.17	960	322.58	540	326.00	5350	324.26	2430	326.48	6160	322.74	635	321.94	233	321.60	105	321.74	155
21	322.49	490	322.39	439	322.97	795	323.14	935	322.57	555	325.79	4990	324.34	2570	326.50	6190	322.68	595	321.92	225	321.62	112	321.74	155
22	322.68	600	322.36	425	323.28	1080	323.13	925	322.56	550	325.65	4760	324.34	2570	326.39	6000	322.68	595	321.92	225	321.63	116	321.74	155
23	322.84	700	322.37	430	323.47	1280	323.11	910	322.55	525	325.69	4830	324.36	2590	326.11	5540	322.59	545	321.90	216	321.64	119	321.72	148
24	322.94	770	322.39	444	323.53	1370	323.02	855	322.54	520	325.69	4830	324.33	2540	325.79	4990	322.56	530	321.90	216	321.63	116	321.69	137
25	322.96	785	322.40	444	323.53	1590	322.99	810	322.54	520	325.71	4870	324.29	2470	325.58	4650	322.51	500	321.87	205	321.61	109	321.69	137
26	322.94	770	322.38	434	323.95	1920	322.94	740	322.59	545	325.69	4830	324.20	2330	325.45	4420	322.47	480	321.84	193	321.62	112	321.67	130
27	322.91	750	322.42	454	324.30	2490	322.88	725	322.88	725	325.60	4680	324.11	2180	325.14	3910	322.48	485	321.85	197	321.64	119	321.68	133
28	322.89	730	322.43	459	324.73	3220	322.78	660	322.84	740	325.60	4680	323.98	1960	324.93	3550	322.38	434	321.85	197	321.60	105	321.68	133
29	322.90	740	322.39	439	324.58	2960	322.85	705	324.69	3150	325.41	4360	323.87	1800	324.75	3250	322.34	415	321.80	178	321.53	82	321.64	119
30	322.90	740	322.32	406	324.81	3350	.....	.....	325.37	4290	325.16	3940	324.07	2110	324.65	3080	322.33	410	321.80	178	321.60	105	321.64	119
31	.....	.....	322.37	430	325.14	3910	.....	.....	326.40	6020	.....	.....	324.30	2490	.....	.....	322.30	396	321.81	182	.....	.....	321.59	102

Monthly Discharge of Moira River near Foxboro for 1915-6.

Drainage Area 1,038 Square Miles

Month.	Discharge in Second-feet.			Discharge in Second-feet per Square Mile.			Run-off.
	Maximum.	Minimum.	Mean.	Maximum.	Minimum.	Mean.	Depth in inches on Drainage Area.
November (1915)	785	242	411	.76	.23	.40	.45
December "	730	401	501	.70	.39	.48	.55
January (1916)	3,910	454	1,151	3.77	.44	1.11	1.28
February	4,580	660	1,989	4.41	.64	1.92	2.07
March	6,020	520	1,025	5.80	.50	.99	1.14
April	8,360	3,940	5,761	8.05	3.80	5.55	6.19
May	3,700	1,480	2,434	3.56	1.43	2.33	2.69
June	6,190	2,610	3,790	5.96	2.51	3.65	4.07
July	3,830	396	1,148	2.73	.38	1.11	1.28
August	382	178	264	.37	.17	.25	.29
September	174	82	136	.17	.08	.13	.15
October	155	79	108	.15	.08	.10	.12
The year	8,360	79	1,540	8.05	.08	1.48	20.10

Napanee River near Napanee

Location—At Mink's Bridge, three miles from Napanee, near lot 1, concession 1, Township of Camden, County of Addington.

Records Available—Discharge measurements from August, 1915, and gauge readings from September 8, 1915.

Drainage Area—300 square miles.

Gauge—Standard gauge plates 0 to 6 ft. firmly secured to a 4 x 4 in. pine driven in river bottom and spiked and wired to one of three elms in one cluster on the right bank 400 ft. above the bridge and section.

Channel and Control—The channel is curved above the section to within 20 feet of the bridge, and is straight for 300 feet below. The right bank is high, while the left is comparatively low and liable to overflow. The bed of the stream is composed of rocks and gravel, not likely to shift.

Discharge Measurements—Made by wading at low stages and from bridge at high stages.

Winter Flow—Relation of gauge height to discharge is affected by ice.

Regulation—There are several power developments on the upper part of the river, and also lumber dams on tributary waters.

Accuracy—Two daily readings give only fair mean daily gauge heights.

Observer—Mrs. Dan. O'Shaughnessy, Napanee.

Discharge Measurements of Napanee River near Napanee in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 12	West. C. W.	64	74	1.02	101.77	76 (a)	.....
Dec. 4 ..	" ..	64	100	1.43	102.20	143 (b)	.....
1916							
Jan. 6,	" ..	64	196	2.07	103.58	407 (c)	.....
Feb. 12 ..	Campbell, L. L.	64	299	2.23	105.62	668 (d)	.....
Mar. 11 ..	" ..	64	123	2 04	103.50	251	.....
Apr. 4 ..	" ..	64	490	4 66	108.23	2286	.....
May 30 ..	" ..	64	298	3.36	105.25	1003	.....
June 27 ..	" ..	64	350	3.98	106.08	1392	.....
July 27 ..	McLennan, C. C.	64	87	1.49	101.99	130	.....
Sep. 19 ..	Campbell, L. L.	48	31	1.17	101.07	36 (e)	.....

(a) Weeds may affect.

(b) Ice at edges of river, above and below section.

(c) Ice above and below section.

(d) Ice measurement.

(e) Dam under construction at Colbrook. Water being held at Petworth dam.

Daily Gauge Height and Discharge of Napanee River near Napanee for 1915-16

Drainage Area 300 Square miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	101.83	100	102.12	137	102.33	167	106.17	1040	103.50	215	108.29	2310	105.25	1030	105.08	960	105.96	1330	102.05	127	101.38	54	101.30	48
2	101.79	95	102.12	137	102.29	161	106.08	1010	103.54	226	108.38	2390	105.29	1050	105.08	960	106.00	1340	102.09	133	101.38	54	101.38	54
3	101.79	95	102.12	137	102.21	150	106.75	1280	103.56	233	108.25	2290	105.42	1100	105.17	995	106.29	1470	101.88	106	101.30	48	101.30	48
4	101.75	91	102.12	137	102.46	188	107.17	1440	103.50	226	108.29	2310	104.79	840	105.17	995	106.67	1630	101.97	117	101.30	48	101.22	43
5	101.75	91	102.04	126	102.75	238	108.00	1770	103.58	243	108.35	2330	104.71	805	105.17	995	106.62	1610	101.97	117	101.26	46	101.22	43
6	101.67	82	102.12	137	102.71	231	107.25	1440	103.50	233	108.88	2550	104.50	720	105.08	960	105.58	1170	101.51	66	101.26	46	101.22	43
7	101.71	86	102.08	131	102.29	155	107.25	1430	103.54	243	108.62	2450	104.33	655	104.92	890	104.50	720	101.80	96	101.22	43	101.22	43
8	101.79	95	102.12	137	102.67	212	106.96	1290	103.50	240	108.67	2470	104.29	640	104.58	755	104.38	675	101.80	96	101.22	43	101.13	38
9	101.79	95	102.12	137	102.71	212	107.25	1400	103.50	243	108.12	2230	104.12	580	104.71	805	104.04	555	101.88	106	101.22	43	101.13	38
10	101.75	91	102.08	131	102.62	192	106.17	935	103.42	233	108.08	2220	104.04	555	104.75	820	103.88	505	101.72	87	101.22	43	101.22	43
11	101.71	86	102.12	137	102.67	193	105.71	730	103.42	236	108.04	2200	104.12	580	105.33	1060	103.71	452	101.88	106	101.22	43	101.22	43
12	101.79	95	102.21	150	102.67	185	105.66	705	103.42	256	107.25	1870	104.12	580	105.50	1130	103.67	441	101.88	106	101.22	43	101.22	43
13	101.75	91	102.33	167	103.39	368	105.33	575	103.42	261	107.50	1980	103.79	475	105.42	1100	103.58	418	101.55	70	101.26	46	101.22	43
14	101.79	95	102.29	161	102.75	197	105.17	550	103.42	267	108.00	2180	103.75	464	105.25	1030	103.50	394	101.38	54	101.30	48	101.22	43
15	101.75	91	102.33	167	102.71	183	105.08	510	103.44	275	108.50	2390	103.75	464	105.17	995	103.50	394	101.34	51	101.30	48	101.22	43
16	101.75	91	102.21	150	102.79	190	105.04	505	103.33	256	108.52	2400	104.12	580	105.50	1130	103.12	308	101.22	43	101.22	43	101.30	48
17	101.71	86	102.29	161	102.79	183	104.92	472	103.33	265	108.10	2230	106.00	1340	108.04	2200	103.12	308	101.30	48	101.22	43	101.30	48
18	101.79	95	102.29	161	102.71	172	104.62	394	103.33	271	108.02	2190	105.71	1220	107.29	1890	102.71	231	101.47	62	101.22	43	101.30	48
19	101.96	116	102.29	161	102.75	173	104.42	352	103.33	276	108.00	2180	105.54	1150	106.67	1630	102.58	208	101.47	62	101.26	46	101.30	48
20	102.12	137	102.29	161	102.71	161	104.12	290	103.33	275	107.35	1910	105.58	1170	106.67	1630	102.50	195	101.30	48	101.13	38	101.30	48
21	102.12	137	102.29	161	102.67	150	104.04	280	103.42	306	106.71	1640	105.50	1130	106.67	1630	102.50	195	101.30	48	101.09	36	101.30	48
22	102.79	245	102.25	156	102.75	157	103.88	254	103.38	304	106.67	1630	105.50	1130	106.67	1630	102.50	195	101.30	48	101.05	35	101.34	51
23	102.29	161	102.29	161	102.67	141	103.88	258	103.29	292	107.00	1770	105.58	1170	106.58	1590	102.33	167	101.34	51	101.05	35	101.47	62
24	101.92	111	102.29	161	102.67	141	103.88	258	103.26	290	107.25	1870	105.58	1170	106.50	1560	102.42	181	101.30	48	101.05	35	101.47	62
25	101.71	86	102.33	167	103.83	332	103.71	234	103.25	296	107.60	2020	105.46	1120	106.83	1690	102.33	167	101.38	54	101.05	35	101.42	58
26	102.29	161	102.42	181	104.25	427	103.69	234	103.54	365	107.00	1760	105.42	1100	106.67	1630	102.29	161	101.38	54	101.05	35	101.30	48
27	102.29	161	102.67	224	105.38	810	103.62	296	104.29	595	107.02	1770	105.42	1100	106.21	1430	102.29	161	101.38	54	101.22	43	101.22	43
28	102.12	137	102.58	209	106.00	1050	103.62	229	106.21	1390	106.02	1350	105.17	995	106.17	1430	102.12	137	101.38	54	101.22	43	101.30	48
29	102.21	150	102.46	188	104.83	575	103.54	219	108.75	2470	106.00	1340	105.12	975	106.17	1420	102.00	121	101.38	54	101.30	48	101.38	54
30	102.21	150	102.42	181	105.42	700	.....	.....	109.50	2800	106.00	1340	105.12	975	106.08	1380	102.00	121	101.38	54	101.30	48	101.42	58
31	.....	.....	102.38	175	105.67	870	.....	.....	109.00	2600	.....	.....	105.17	995	.....	.....	102.08	131	101.38	54	.....	.....	101.38	54

Monthly Discharge of Napanee River near Napanee for 1915-6

Drainage Area, 300 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	245	82	117	.82	.27	.59	.44
December.....	224	126	158	.75	.42	.53	.61
January ..(1916)	1,050	141	307	3.50	.47	1.02	1.18
February	1,770	219	700	5.90	.73	2.33	2.51
March.....	2,800	215	538	9.33	.72	1.79	2.06
April.....	2,550	1,340	2,052	8.50	4.47	6.84	7.63
May.....	1,340	464	899	4.47	1.55	3.00	3.46
June	2,200	805	1,277	7.33	2.68	4.26	4.75
July.....	1,630	121	519	5.43	.40	1.73	1.99
August	133	43	73	.44	.14	.24	.28
September.....	54	35	45	.18	.12	.14	.16
October.....	62	38	48	.21	.13	.16	.18
The year	2,800	35	557	9.33	.12	1.86	25.32

Petawawa River near Petawawa

Location—About 1½ miles southwest of Petawawa station above C.P.R. bridge, near lot 15, concession 7, Township of Petawawa, County of Renfrew.

Records Available—Discharge measurements from October, 1915, and daily gauge heights from November 5, 1915.

Drainage Area—1,572 square miles.

Gauge—Temporary mark used from December 15, 1915, to February 29, 1916, to obtain water elevations afterwards reduced to same datum as permanent gauge, screwed to plank, bolted to large rock in river, back of Rantzs' house, 1,000 feet above the station, and 200 feet above the head of the rapids. This gauge has been used for gauge readings since March 1, 1916.

Discharge Measurements—The discharge measurements for normal and low flows, summer and winter, are made by wading in fast water near the end of the straight stretch in the river downstream from the gauge. At high water measurements are made opposite the hotel in the lower village from a boat.

Channel and Control—The controlling section is a few hundred yards above the metering section. The river is straight for a few hundred feet each side of the section, but is crooked and fast for two miles below the section. The soundings for depth are taken for each metering as the water is fast and the river bed of stones may change slightly between meterings, and the depths do not change the same as the gauge readings.

Winter Flow—The control here is at fast water and only slightly affected by ice.

Accuracy—Gauge readings twice daily give good mean daily gauge height as the fluctuation at the gauge is slow.

Observer—Elsa Rantz, Petawawa.

Discharge Measurements of Petawawa River near Petawawa in 1915-6

Date	Hydrographér	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 5....	West, C. W.....	163	231	2.91	101.58	673	.....
Dec. 15....	"	162	231	2.91	101.57	605 (a)	.....
1916							
Jan. 28....	Campbell, L. L..	160	215	2.90	101.74	623 (a)	.....
Feb. 25....	McLennan, C. C.	158	234	3.18	101.78	745 (a)	.....
Mar. 23....	"	145	203	3.10	101.71	629 (b)	.....
June 15....	"	319	1,805	1.61	103.50	2,921	.....
July 12....	"	312	1,466	1.28	102.79	1,879	.....
Sept. 8....	"	169	260	3.40	101.92	882	.....
Oct. 28....	Campbell, L. L..	197	327	3.62	102.33	1,186	.....

(a) Section open. Lake above frozen.
(b) Ice at edges of section.

Daily Gauge Height and Discharge of Petawawa River near Petawawa for 1915-6

Drainage Area 1,572 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.	Gauge Ht.	Dis- charge	Sec-ft.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Monthly Discharge of Petawawa River near Petawawa for 1915-6

Drainage Area, 1,572 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
1915							
November							
December	650	595	615	.41	.38	.39	.25
December 15-31..	725	580	631	.46	.37	.40	.46
January (1916).	785	740	761	.50	.47	.48	.51
February	990	705	762	.63	.45	.48	.55
March.....	4,780	1,180	2,791	3.04	.75	1.78	1.99
April.....	5,000	3,830	4,358	3.18	2.44	2.77	3.19
May	4,460	2,780	3,579	2.84	1.77	2.28	2.54
June.....	3,680	1,660	2,201	2.34	1.06	1.40	1.61
July.....	1,410	675	992	.90	.43	.63	.73
August	735	615	692	.46	.39	.44	.49
September	1,230	560	738	.78	.36	.46	.53
October.....							
The period.....	5,000	560	1,691	3.18	.36	1.08	12.93

Tay River near Glen Tay

Location—Near lots 20 and 21, concession 11, Township of Bathurst, County of Lanark. At the highway bridge north of the Village of Glen Tay, and east of the auxiliary plant of the Canadian Electric & Water Company, Limited, of Perth and Ottawa.

Records Available—Discharge measurements July, 1915, and gauge readings from July 10, 1915.

Drainage Area—204 square miles.

Gauge—Vertical steel staff 0 to 3 feet fastened to the pier of bridge one foot above section.

Channel and Control—The channel is straight from the dam 150 feet above and straight for 250 feet below the section. The banks are high, and not liable to overflow. The bed of the river is composed of shale and stones, not shifting. The flow is confined between the bridge abutments at all stages. The control is a short distance below the section, and the flood flow is likely to disturb it to some extent.

Discharge Measurements—Made by wading at ordinary stages, and from the bridge at very high stages.

Winter Flow—Channel at section likely free from ice during winter, but will be affected by ice formation below the section.

Regulation—The river is dammed immediately above the section and one mile further up, for power purposes, and the Department of Railways and Canals operate a dam at the foot of Bob's Lake for regulating canal purposes.

Accuracy—The open-water rating will be very good.

Observer—Paul Griffin, Manion P.O.

Discharge Measurements of Tay River near Glen Tay in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 8.....	West, C. W.	48	60	2.78	94.38	166	.....
" 30.....	"	48	58	2.69	94.34	157	.....
1916							
Jan. 10.....	"	40	37	2.02	94.05	74	.....
Feb. 9.....	"	42	56	2.90	94.38	161(a)	.....
Mar. 7.....	McLennan, C. C.	29	56	3.15	94.80	175(b)	.....
Apr. 3.....	Campbell, L. L. .	43	172	5.72	96.71	981	.....
May 26.....	McLennan, C. C..	48	104	5.49	95.38	573	.....
June 21.....	Campbell, L. L. .	47	158	5.89	96.38	927	.....
Sept. 20....	"	46	45	1.70	94.05	76	.....
Oct. 12.....	"	35	32	2.27	94.05	72	.....

(a) Ice at north edge of section.

(b) Ice below section.

Daily Gauge Height and Discharge of Tay River near Glen Tay for 1915-6
Drainage Area, 204 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge			
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.				
1	93.63	28	146	94.34	146	94.05	71	95.55	590	94.42	86	97.75	1400	94.88	342	95.55	590	95.67	635	94.55	220	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
2	93.96	56	152	94.36	152	94.46	188	95.01	390	94.55	113	97.46	1300	95.01	390	95.46	555	95.63	620	94.55	220	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
3	93.94	53	141	94.01	63	94.01	63	94.92	357	94.59	121	96.67	1010	95.01	390	95.63	620	95.63	620	94.55	220	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
4	93.94	53	141	94.01	63	94.09	79	94.82	320	94.67	142	96.21	835	95.15	442	95.63	620	95.55	590	94.55	220	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
5	93.96	56	152	93.96	56	94.09	79	94.61	243	94.63	124	95.63	620	95.13	435	95.63	620	95.42	540	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
6	93.96	56	152	93.98	58	94.25	119	94.55	220	94.80	173	95.57	595	95.09	420	95.55	590	95.30	498	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
7	94.01	63	152	93.98	58	94.01	63	94.48	195	94.69	132	95.25	479	94.96	372	95.55	590	95.38	530	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
8	94.26	152	162	94.01	63	94.13	88	94.48	250	94.80	173	95.30	498	94.96	372	95.55	590	95.21	464	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
9	94.34	146	162	93.96	56	93.96	56	94.40	166	94.98	246	95.21	464	94.92	357	95.84	700	95.09	420	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
10	93.96	56	152	93.98	58	93.96	56	94.36	152	95.11	298	95.13	435	94.88	342	95.84	700	95.09	420	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
11	93.96	56	152	94.01	63	93.92	51	94.32	132	95.11	306	95.05	405	94.88	342	96.17	820	94.88	342	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
12	93.96	56	152	94.05	71	94.19	102	94.30	124	95.13	316	95.09	420	94.88	342	96.21	820	94.88	342	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188	94.46	188			
13	93.96	56	152	94.05	71	93.98	58	94.35	142	95.19	346	95.01	390	94.80	313	96.09	790	94.80	313	94.38	159	94.30	132	94.30	132	94.30	132	94.30	132	94.30	132	94.30	132			
14	93.94	53	141	94.05	71	94.21	108	94.25	102	95.15	335	94.96	372	94.80	313	95.92	725	94.75	294	94.42	173	94.34	146	94.51	206	94.51	206	94.51	206	94.51	206	94.51	206			
15	93.96	56	152	94.05	71	93.88	46	94.17	79	94.80	213	95.05	405	94.71	280	95.80	685	94.80	313	94.34	146	94.51	206	94.51	206	94.51	206	94.51	206	94.51	206	94.51	206			
16	93.96	56	152	94.05	71	93.96	56	94.25	95	94.92	261	95.25	479	94.71	280	95.80	685	94.80	313	94.34	146	94.51	206	94.51	206	94.51	206	94.51	206	94.51	206	94.51	206			
17	93.96	56	152	94.05	71	93.96	56	94.21	81	95.07	324	95.09	420	95.96	740	96.55	960	94.75	294	94.46	188	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
18	93.96	56	152	94.05	71	94.19	102	94.23	83	95.03	313	94.94	365	96.38	900	96.55	960	94.80	313	94.46	188	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
19	93.96	56	152	94.05	71	94.19	102	94.15	63	95.23	394	94.80	313	96.51	945	96.55	960	94.80	313	94.46	188	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
20	94.03	67	159	94.09	79	94.19	102	94.03	46	95.15	368	94.71	280	96.01	760	96.63	990	94.80	313	94.46	188	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
21	94.13	88	162	94.09	79	94.19	102	94.07	47	95.19	394	94.73	287	95.46	555	96.46	925	94.71	280	94.55	220	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
22	94.11	83	152	94.51	206	94.42	173	94.07	47	95.19	394	94.73	287	95.46	555	96.46	925	94.71	280	94.55	220	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
23	94.36	159	183	94.51	206	94.42	173	94.07	47	95.19	394	94.73	287	95.46	555	96.46	925	94.71	280	94.55	220	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
24	94.38	159	183	94.51	206	94.42	173	94.07	47	95.19	394	94.73	287	95.46	555	96.46	925	94.71	280	94.55	220	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
25	93.98	58	159	94.21	108	94.19	102	94.33	86	94.96	320	95.28	490	95.83	620	96.13	805	94.71	280	94.55	220	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
26	94.34	146	162	94.09	79	95.17	450	94.11	45	95.13	394	94.96	372	95.38	530	95.96	740	94.63	250	94.55	220	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
27	94.34	146	162	94.13	88	95.11	427	94.21	54	95.11	394	94.96	372	95.38	530	95.96	740	94.63	250	94.55	220	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
28	93.96	56	152	94.30	132	95.13	435	94.38	83	95.05	376	94.96	372	95.38	530	95.92	725	94.59	235	94.55	220	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119	94.25	119			
29	94.01	63	152	94.34	146	94.38	250	94.38	79	95.42	520	94.92	357	95.38	530	95.80	685	94.55	220	94.46	188	94.17	98	94.17	98	94.17	98	94.17	98	94.17	98	94.17	98			
30	93.98	58	159	94.63	250	94.59	235	.....	.....	97.38	1250	94.92	357	95.55	590	95.75	665	94.55	220	94.46	188	94.17	98	94.17	98	94.17	98	94.17	98	94.17	98	94.17	98	
31	.....	.....	.....	94.17	98	94.71	280	.....	.....	97.80	1420	.....	.....	95.63	620	.....	.....	94.55	220	94.46	188	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Monthly Discharge of Tay River near Glen Tay for 1915-6

Drainage Area 204 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	159	28	76	.78	.14	.37	.41
December . "	250	56	98	1.23	.27	.48	.55
January .. (1916)	450	46	158	2.21	.23	.77	.89
February	590	45	153	2.89	.22	.75	.81
March.....	1,420	86	354	6.96	.42	1.74	2.01
April.....	1,400	250	509	6.86	1.23	2.50	2.79
May.....	945	280	497	4.63	1.37	2.44	2.81
June....	990	555	752	4.85	2.72	3.69	4.12
July.....	635	220	363	3.11	1.08	1.78	2.05
August	220	146	197	1.08	.72	.97	1.12
September	220	63	149	1.08	.31	.73	.81
October.....	188	51	74	.92	.25	.36	.42
The year	1,400	28	281	6.96	.14	1.38	18.78

York River near Bancroft

Location—At the highway bridge one and a half miles below Bancroft, near lots 53 and 54, west of the Hastings Road, Township of Faraday, County of Hastings.

Records Available—Discharge measurements from July, 1915. Daily gauge heights from July 16, 1915.

Drainage Area—374 square miles.

Gauge—Vertical standard gauge plates 0 to 6 ft. secured on the upstream face of the right bridge pier near the west corner.

Channel and Control—The channel is straight for 400 feet above and 250 feet below the section. The banks are high and sandy, not liable to overflow. The bed is composed of gravel. Flow takes place in two channels under the bridge at high stages, and in one channel at lower stages.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—Ice will materially affect the open-water relation of gauge heights to discharge, and frazil ice at times makes meterings difficult.

Regulation—The dam at Bancroft gives very small storage, and the plants there do not use the entire flow. On account of the electrical plant working at night, and the other mills during the day, daily gauge readings give fairly accurate figures for the mean daily stage. Some of the tributary streams are controlled by dams for storage and driving purposes for the lumber industry.

Accuracy—As the river bed is composed of gravel, slight movement no doubt takes place without changing the general profile and section.

Observer—J. L. Churcher, Bancroft.

Discharge Measurements of York River near Bancroft in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 11....	West, C. W.	55	207	1.06	101.21	220	.....
Dec. 3....	“ ..	55	212	1.17	101.31	248 (a)	.....
1916							
Jan. 7....	“ ..	55	205	1.05	101.71	216 (b)	.....
Feb. 10....	McLennan, C. C. ..	55	262	1.14	102.24	298 (c)	.....
Mar. 8....	“ ..	55	308	1.82	103.38	561 (d)	.....
April 5....	Campbell, L. L. .	69	485	2.54	105.29	1,232	.....
May 31....	“ ..	68	376	2.04	103.70	769	.....
June 28....	“ ..	68	269	1.41	102.06	380	.....
July 24....	McLennan, C. C. .	56	223	1.28	101.54	286	.....
Oct. 11....	Campbell, L. L. .	56	184	.73	100.83	135	.....

- (a) Ice along edges of river, above and below section.
- (b) Ice on both sides of river.
- (c) Frazil ice at section. Sides of section frozen.
- (d) Section almost entirely ice covered.

Monthly Discharge of York River near Bancroft for 1915-6

Drainage Area 374 square miles

Month.	Discharge in Second-feet.			Discharge in Second-feet, per square mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	264	194	227	.71	.52	.60	.67
December "	344	200	248	.92	.53	.66	.76
January ..(1916)	338	186	274	.90	.50	.73	.84
February	493	248	345	1.32	.66	.92	.99
March	1,300	338	752	3.48	.90	2.01	2.32
April	1,730	1,130	1,420	4.63	3.02	3.80	4.24
May	1,730	485	1,000	4.63	1.30	2.67	3.08
June	735	326	544	1.97	.87	1.45	1.62
July	298	244	275	.80	.65	.74	.85
August	270	228	240	.72	.61	.64	.74
September	238	179	216	.64	.48	.58	.65
October	207	113	165	.55	.30	.44	.51
The year	1,730	113	475	4.63	.30	1.27	17.29

Regular Stations

NORTHERN ONTARIO DISTRICT

River	Location	Drain- age Area Sq. Miles	Township	District
aux Sables	at Massey	524	Salter	Sudbury
Blanche	near Englehart	230	Evanturel	Timiskaming
Frederickhouse	at Frederickhouse	1,252	Clute	"
Kagawong	at Kagawong	94	Allan	Manitoulin Island
Maganetawan, North.	near Burk's Falls	107	Armour	Parry Sound
South.	" " "	257	"	"
Mississagi	at Iron Bridge	3,565	Gladstone	Algoma
Muskoka, N. Branch.	near Port Sydney	560	Stephenson	Muskoka
Muskoka, S. Branch.	at Tretheway's Falls..	688	Draper	"
Seguin	near Parry Sound	380	McDougall	Parry Sound
South	near Powassan	294	Himsworth	Parry Sound
Spanish	at Espanola	4,490	Merritt	Sudbury
Sturgeon	at Smoky Falls	2,250	Field	Nipissing
Vermilion	near Whitefish	1,580	Graham	Sudbury
Wanapitei	at McVitties		Secord	"

aux Sables River at Massey

Location—About 800 feet upstream from C.P. Ry bridge, and $\frac{1}{4}$ mile north-east of railway station, in the Village of Massey, Township of Salter, Sudbury District.

Records Available—Discharge measurements from August, 1914, to October, 1916. Daily gauge heights from June 10, 1915, to October 31, 1916.

Drainage Area—524 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, fastened to rock on left shore 400 feet above railway bridge. Zero of the gauge (elev. 15.00 feet) is referred to bench mark (elev. 29.76 feet) painted on top of rock near gauge.

Channel and Control—Straight for 1,000 feet above and 500 feet below the gauging station to a rapid. Both banks are high, rocky, wooded, and are not liable to overflow. The bed of the stream is composed of clay and gravel, practically permanent. The velocity is moderate, and one channel exists at all stages.

Discharge Measurements—Made by wading during low water periods. At high stages measurements are made from boat with a Price current meter.

Regulation—The operation of logging dams above cause fluctuations in gauge heights during the log-driving season.

Observer—Jas. Blight, Massey.

Discharge Measurements of aux Sables River at Massey in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 20,	Murray, W. S..	96	392	1.91	20.33	752	.....
Dec. 6	" ..	95	578	1.95	21.70	1,129 (a)	.....
1916							
Feb. 4,	" ..	75	154	2.55	18.04	393 (b)	.....
Mar. 9	" ..	77	127	2.27	17.25	287 (b)	.....
Apr. 14	" ..	96	963	2.32	26.40	2,241 (c)	.....
May 11	" ..	97	822	2.15	24.20	1,772	.....

(a) Ice on control.

(b) Ice measurement.

(c) River rising rapidly.

Daily Gauge Height and Discharge of aux Sables River at Massey for 1915-6

Drainage Area 524 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge
	Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.	
1	18.29	434		22.62	1330		16.58	228		18.66	390		17.66	349		21.41	1040		27.82	2580		22.33	1260		26.54	2270		16.04	179		15.04	112		17.37	314	
2	18.50	465		22.50	1300		16.58	228		18.83	390		17.58	340		24.00	1660		27.32	2460		23.46	1530		26.54	2270		16.04	179		15.04	112		17.37	314	
3	18.50	465		22.62	1330		16.58	228		18.04	390		17.50	330		26.00	2140		27.20	2430		26.04	2150		26.54	2270		16.04	179		15.04	112		17.37	314	
4	18.37	445		22.39	1270		16.58	228		18.00	390		17.50	330		26.00	2140		26.37	2230		26.04	2150		26.54	2270		16.04	179		15.04	112		17.37	314	
5	18.29	434		21.66	1100		16.58	228		18.00	390		17.33	310		26.00	2140		26.42	2240		26.04	2150		26.54	2270		16.04	179		15.04	112		17.37	314	
6	18.16	414		21.54	1070		21.70	390		18.00	390		17.33	310		25.50	2020		26.00	2140		26.04	2150		26.54	2270		16.04	179		15.04	112		17.37	314	
7	18.16	414		21.45	1050		20.62	390		18.00	390		17.33	310		25.40	2000		25.33	1980		25.62	2050		26.54	2270		16.04	179		15.04	112		17.37	314	
8	18.08	402		21.29	1010		19.91	390		18.00	390		17.33	310		25.00	1900		24.79	1850		24.79	1850		22.62	1330		16.04	179		15.04	112		17.37	314	
9	18.16	414		21.16	798		19.16	390		18.00	390		17.33	310		24.70	1830		24.91	1880		24.33	1740		21.95	1170		16.04	179		15.04	112		17.37	314	
10	18.25	428		20.87	911		19.08	390		18.00	390		17.33	310		25.04	1910		25.16	1940		24.12	1690		21.95	1170		16.04	179		15.04	112		17.37	314	
11	18.33	440		18.16	414		19.08	390		18.00	390		17.33	310		25.37	1990		24.70	1830		24.04	1670		21.95	1170		16.04	179		15.04	112		17.45	324	
12	18.45	458		18.00	390		19.08	390		18.00	390		17.33	310		25.70	2070		25.00	1900		24.04	1670		21.54	1070		16.04	179		15.62	148		17.57	338	
13	19.66	662		18.00	390		19.08	390		18.00	390		17.33	310		26.12	2170		24.70	1830		24.42	1760		21.12	970		16.04	179		16.12	186		17.57	338	
14	20.16	762		17.83	370		19.08	390		18.66	405		17.66	349		26.62	2290		25.04	1910		24.79	1850		20.75	885		16.04	179		16.50	220		17.57	338	
15	20.33	796		17.62	344		19.08	390		18.66	420		17.66	349		27.20	2430		25.25	1960		24.98	1900		20.62	855		16.04	179		16.87	257		17.54	335	
16	20.62	856		17.37	314		19.08	390		18.66	435		17.66	349		27.20	2430		25.12	1930		25.25	1960		20.79	895		16.04	179		17.04	275		17.54	335	
17	20.62	856		17.16	289		19.08	390		18.58	450		17.58	340		27.58	2520		24.95	1890		25.37	1990		20.04	740		16.04	179		17.20	294		18.04	396	
18	20.57	830		16.83	253		19.08	390		18.50	465		17.58	340		28.11	2650		24.87	1870		28.61	2770		18.91	525		16.04	179		17.16	289		18.33	440	
19	20.30	804		19.16	568		19.08	390		18.29	433		17.50	330		28.36	2710		24.66	1820		28.61	2770		18.37	445		16.04	179		17.12	284		19.29	590	
20	20.29	788		18.95	533		19.08	390		18.29	433		17.50	330		28.57	2760		24.96	1890		28.61	2770		17.95	384		16.04	179		16.91	261		19.62	655	
21	20.37	804		18.75	503		19.08	390		18.04	396		17.41	319		29.07	2880		23.79	1590		28.40	2720		17.70	354		16.04	179		16.87	257		20.12	755	
22	20.35	780		18.58	477		19.08	390		18.00	390		17.37	314		30.03	3130		23.70	1590		28.28	2690		17.20	294		15.50	140		16.87	257		20.12	755	
23	20.16	762		18.66	489		19.00	390		18.00	390		17.37	314		30.36	3190		23.79	1610		28.15	2660		17.20	294		15.75	158		16.87	257		21.04	950	
24	20.08	746		18.55	473		19.00	390		18.00	390		17.37	314		30.36	3190		24.04	1670		27.65	2540		17.12	284		15.70	154		16.87	257		22.04	1190	
25	19.95	720		18.33	440		19.00	390		18.00	390		17.37	314		30.36	3190		24.04	1670		27.65	2540		16.95	265		16.87	257		16.87	257		22.04	1190	
26	19.79	688		16.58	228		19.00	390		18.00	390		17.33	310		30.36	3190		24.04	1670		27.45	2490		16.83	253		15.54	143		16.87	257		23.16	1460	
27	19.75	680		16.58	228		19.00	390		17.87	374		17.42	344		30.36	3190		23.54	1550		26.70	2550		16.70	240		15.54	143		16.91	261		23.70	1590	
28	23.16	1460		16.58	228		19.00	390		17.75	360		18.49	463		30.03	3110		22.50	1300		26.95	2370		16.66	236		15.45	137		16.99	269		24.37	1750	
29	23.16	1460		16.58	228		19.00	390		17.66	349		18.99	538		29.44	2970		21.70	1110		26.83	2340		16.54	224		15.33	130		17.08	280		24.95	1890	
30	23.00	1420		16.58	228		19.08	390		19.08	554		19.08	554		29.03	2870		21.79	1130		26.59	2280		16.37	208		15.20	122		17.12	284		25.20	1950	
31	.....	.....		16.58	228		18.91	390		.....	.....		20.54	837		.....	.....		22.03	1190		.....	.....		16.08	182		15.08	115		.....	.....		25.20	1950	

Monthly Discharge of aux Sables River at Massey for 1915-6

Drainage Area 524 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	1,460	402	703	2.78	.77	1.34	1.50
December "	1,330	228	606	2.54	.44	1.16	1.34
January .. (1916)	390	228	364	.74	.44	.69	.80
February	465	349	398	.89	.67	.76	.82
March	835	310	359	1.59	.59	.69	.80
April	3,190	1,040	2,454	6.08	1.98	4.68	5.22
May	2,580	1,110	1,828	4.92	2.12	3.49	4.02
June	2,770	1,260	2,170	5.29	2.40	4.14	4.62
July	2,270	182	978	4.33	.35	1.87	2.16
August	179	115	166	.34	.22	.32	.37
September	294	112	203	.56	.21	.39	.44
October	1,950	314	735	3.72	.60	1.40	1.61
The year	3,190	112	911	6.08	.21	1.74	23.70

Blanche River near Englehart

Location—At the highway bridge near the High Falls, $3\frac{1}{2}$ miles north-west of the Town of Englehart, north half of lot 12, concession 3, Township of Evanturel, Temiskaming District.

Records Available—Discharge measurements, August, 1914, to October, 1916. Daily gauge heights, October 8, 1914, to October 31, 1916.

Drainage Area—430 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, and located on the southwest corner of the wing wall of the bridge. The zero on the gauge (elev. 10.00) is referred to a bench mark (elev. 23.39), painted on a prominent rock on the right bank, 75 feet below the bridge.

Channel—At a point 200 feet above the station, the river curves from the right and then flows straight, up to a point 700 feet below the station. Both banks are high, rocky, wooded, and will not overflow. The bed of the stream is composed of clay, practically permanent. The current is very slow, flowing through 2 channels at low stages and 3 channels during high water periods.

Discharge Measurements—Made from the highway bridge with a Price current meter.

Regulation—A temporary dam is built above the station during the summer months. This dam is used for storing water during the period when the river is used for log driving. The gauge heights at the section are therefore affected during the log driving periods.

Winter Flow—During the winter months measurements are made through the ice to determine the winter discharge. The relation of gauge height to discharge is seriously affected by ice.

Accuracy—Rating curve fairly well defined between gauge heights 10.50 feet and 12.00 feet.

Observer—Roy Robinson, Englehart.

Discharge Measurements of Blanche River near Englehart in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 25.	Murray, W. S..	97	640	.52	10.75	334	.....
1916							
Jan. 22.	" ..	72	560	.50	10.66	280(a)	.....
April 18	" ..	116	1,122	2.51	15.42	2,811	.....
May 2 ....	" ..	.....	1,284	3.06	16.50	3,936	.....
June 13	" ..	90	627	.47	10.58	295	.....
July 8	" ..	88	613	.45	10.39	276	.....
Sept. 4	" ..	91	603	.43	10.37	259	.....
Oct. 4	" ..	91	614	.43	10.25	263	.....

(a) Ice measurement.

Monthly Discharge of Blanche River near Englehart for 1915-6

Drainage Area, 430 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November. (1915)	479	352	396	1.11	.82	.90	1.00
December "	1,020	270	682	2.37	.63	1.59	1.83
January .. (1916)	285	176	214	.66	.41	.50	.58
February	228	176	188	.53	.41	.44	.48
March	555	176	277	1.29	.41	.64	.74
April	7,350	580	2,519	17.09	1.35	5.86	6.54
May	3,120	310	1,340	7.26	.72	3.12	3.60
June	372	270	313	.87	.63	.73	.81
July	332	210	260	.77	.49	.60	.69
August	300	192	247	.70	.45	.57	.66
September	248	192	217	.58	.45	.50	.56
October	435	210	285	1.01	.49	.66	.76
The year	7,350	176	577	17.09	.41	1.34	18.24

Frederickhouse River at Frederickhouse

Location—On the T.C. Ry, bridge at the Frederickhouse station, Township of Clute, Sudbury District, 6 miles west of the Town of Cochrane.

Records Available—Discharge measurements from July, 1915, to October, 1916. Daily gauge heights from July 7, 1915, to October 31, 1916.

Drainage Area—1,260 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, and fastened to downstream side of right abutment. Zero of gauge (elev. 9.00 feet) is referred to a bench mark (elev. 10.00 feet) on top of base of same abutment, to which gauge is attached.

Channel and Control—The channel is straight and consists of a number of rapids for about 1 mile above and below the station. The banks are high and wooded, and not liable to overflow. The bed of the stream is composed of clay and boulders, and is shifting. The velocity is high.

Discharge Measurements—Made from bridge with a Price current meter.

Regulation—Temporary dams on river above used for log driving cause fluctuations at gauge.

Observer—Frank Prior, Frederickhouse.

Discharge Measurements of Frederickhouse River at Frederickhouse in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 26....	Murray, W. S..	185	657	4.28	11.93	2,814	.....
Dec. 10....	" ..	190	463	3.69	10.91	1,711(a)	.....
1916							
May 3....	" ..	190	1,246	10.87	15.00	12,202(b)	.....
June 14....	" ..	190	478	4.47	10.96	2,145	.....
July 9....	" ..	190	430	3.67	10.69	1,577	.....
9....	" ..	.....	.....	.....	10.69	1,235(c)	.....

(a) Section partly ice-covered.
(b) Coefficient applied to calculated discharge.
(c) Measurement two miles above regular section.

Monthly Discharge of Frederickhouse River at Frederickhouse for 1915-6

Drainage Area, 1,260 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November. (1915)	2,410	1,840	2,167	1.91	1.46	1.72	1.92
December ..	1,910	1,650	1,744	1.52	1.31	1.38	1.59
January .. (1916)	2,220	1,860	2,060	1.76	1.48	1.63	1.88
February	2,220	1,920	2,112	1.76	1.52	1.68	1.81
March	2,140	1,750	1,788	1.70	1.38	1.42	1.64
April	9,450	2,140	3,588	7.50	1.70	2.85	3.18
May	11,500	2,830	8,501	9.13	2.25	6.75	7.28
June	2,640	1,840	2,092	2.09	1.46	1.66	1.85
July	2,040	900	1,498	1.62	.71	1.19	1.37
August	880	280	580	.70	.22	.46	.53
September	530	280	328	.42	.22	.26	.29
October	950	280	437	.75	.22	.35	.40
The year	11,500	280	2,244	9.13	.22	1.78	24.24

Kagawong River at Kagawong

Location—150 feet below Kagawong Falls in the Village of Kagawong, Township of Billings, Manitoulin Island.

Records Available—Discharge measurements from July, 1915, to October, 1916. Daily gauge heights from July 11, 1915, to October 31, 1916.

Drainage Area—94 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, connected to a 2 x 4 scantling and attached to a large rock in stream 20 feet below the gauging station. Zero of the gauge (elev. 10.00 feet) is referred to a bench mark (elev. 15.86 feet) painted on a rock on right bank at the gauging station. The initial point for soundings is located on an iron post on the left bank opposite the bench mark.

Channel—Straight for about 100 feet above and below the gauging station. Both banks are high and wooded, and are not liable to overflow. The bed of the stream is composed of rock and clay, slightly shifting, one channel existing at all stages.

Discharge Measurements—Made by wading with a small Price current meter.

Regulation—The flow is controlled by the dam 200 feet above the falls.

Accuracy—The daily gauge readings have heretofore been taken before the mill opens and after it closes, so that the estimates of daily discharge made from the mean daily gauge reading are very much too low.

Observer—Stuart Hunt, Kagawong.

Discharge Measurements of Kagawong River at Kagawong in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 18 . . .	Murray, W. S..	21	14	3.80	11.20	53	.....
1916							
June 6	" ..	22	27	3.82	11.58	103	.....
" 6	" ..	22	23	3.19	11.41	73	.....
Oct. 17	" ..	22	31	1.61	11.25	49(a)	.....

(a) Section has been somewhat improved since previous measurement.

Daily Gauge Height and Discharge of Kagawong River at Kagawong for 1915-6
Drainage Area, 94 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.	
1	11.00	32	10.75	18	11.00	32	11.33	62	12.20	110	11.92	175	12.25	245	11.75	140	11.58	104	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
2	11.00	32	10.75	18	11.00	32	11.54	96	11.83	116	12.00	192	12.15	245	11.75	140	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.00	32
3	11.00	32	11.25	53	10.83	22	11.24	52	11.75	118	12.00	192	12.25	245	11.66	121	11.58	104	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.95	29
4	11.00	32	10.77	18	10.83	22	11.20	48	12.37	121	12.16	226	12.25	245	11.50	88	11.49	86	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.83	22
5	11.00	32	10.77	18	10.83	22	11.33	48	11.91	125	12.16	226	12.25	245	11.66	121	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.83	22
6	11.00	32	10.79	20	11.29	57	11.29	47	11.83	72	12.16	226	12.25	245	11.41	74	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
7	10.70	15	10.79	20	12.08	53	11.20	47	11.66	48	12.20	234	12.08	209	11.58	104	11.49	86	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
8	10.87	24	10.79	20	12.16	48	11.29	47	11.45	48	12.20	234	12.16	226	11.58	104	11.49	86	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
9	10.76	18	10.79	20	11.16	45	11.33	44	11.49	46	12.16	226	12.16	226	11.58	104	11.49	86	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
10	10.66	13	10.79	20	10.83	22	11.33	44	11.45	40	12.20	234	12.12	217	11.58	104	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
11	10.87	24	10.79	20	11.00	32	11.54	44	11.33	40	12.16	226	12.16	226	11.41	74	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
12	10.83	22	10.87	24	11.04	35	11.37	42	11.41	53	12.33	261	12.16	226	11.58	104	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
13	10.62	11	10.91	27	11.00	32	12.04	42	11.41	53	12.20	234	12.16	226	11.58	104	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
14	10.62	11	10.96	30	11.50	88	12.91	41	11.54	40	12.25	245	12.00	192	11.58	104	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.87	24
15	10.62	11	11.08	38	11.20	48	11.83	40	11.37	40	12.33	261	12.16	226	11.58	104	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.87	22
16	10.62	11	11.25	53	11.68	38	11.41	40	11.37	40	12.25	245	12.08	209	11.58	104	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
17	10.62	11	11.00	32	11.00	32	11.31	40	11.37	40	12.33	261	12.16	226	11.58	104	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
18	11.16	45	10.75	18	11.00	32	11.10	40	11.33	40	12.33	261	12.16	226	11.58	104	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
19	11.16	45	10.75	18	11.16	36	11.16	40	11.33	40	12.33	261	12.16	226	11.41	74	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
20	11.16	45	10.79	20	11.08	38	11.29	40	11.33	40	12.25	245	11.91	173	11.58	104	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
21	10.66	13	11.00	32	11.12	42	11.58	40	11.33	40	12.33	261	12.00	192	11.58	104	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
22	10.66	13	11.00	32	11.12	42	11.58	40	11.33	40	12.33	261	12.00	192	11.58	104	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
23	10.66	13	10.79	20	11.08	38	11.37	40	11.33	40	12.16	226	12.00	192	11.58	104	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
24	10.67	14	10.79	20	11.12	42	11.12	42	11.41	44	12.33	261	12.00	192	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
25	10.69	15	10.79	20	11.16	45	11.37	68	11.37	44	12.33	261	12.00	192	11.41	74	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
26	10.71	16	10.83	22	11.16	45	11.37	68	11.41	74	12.33	261	12.00	192	11.58	104	11.16	45	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
27	10.75	18	10.83	22	11.40	140	11.58	104	11.50	88	12.16	226	12.00	192	11.58	104	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
28	10.73	16	10.83	22	11.41	74	12.50	108	11.74	137	12.16	226	11.83	156	11.58	104	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
29	10.75	18	10.83	22	11.25	53	12.04	110	11.91	173	12.25	245	11.83	156	11.58	104	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.83	22
30	11.25	53	11.08	38	11.25	53	.....	.....	11.91	173	12.16	226	11.83	156	11.58	104	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27
31	.....	.....	10.41	3	11.25	53	.....	.....	11.91	173	.....	.....	11.75	140	.....	.....	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	11.08	38	10.91	27

Monthly Discharge of Kagawong River at Kagawong for 1915-6

Drainage Area 94 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in inches on Drainage Area
November (1915).	53	11	23	.56	.12	.24	.27
December ..	53	3	24	.56	.03	.26	.30
January ..(1916).	140	22	45	1.49	.23	.48	.55
February	110	40	54	1.17	.43	.57	.61
March.....	73	40	74	1.84	.43	.79	.91
April	261	175	237	2.78	1.86	2.51	2.80
May.....	245	140	207	2.61	1.49	2.20	2.54
June	140	74	101	1.49	.79	1.07	1.19
July	104	32	62	1.11	.34	.66	.76
August	38	32	34	.40	.34	.36	.42
September.....	38	27	32	.40	.29	.34	.38
October	32	22	26	.34	.23	.28	.32
The year	261	3	76	2.78	.03	.81	11.02

Maganetawan River (North Branch) Near Burk's Falls

Location—One mile north of Burk's Falls station, 200 feet upstream from the Grand Trunk Railway bridge, on lot 7, concession 10, Township of Armour, District of Parry Sound.

Records Available—Monthly discharge measurements from June, 1915, to October, 1916. Daily gauge readings from August 1, 1915, to October 31, 1916.

Drainage Area—107 square miles.

Gauge—Vertical steel staff with enamelled face fastened to a 2 x 4 scantling and connected to a wooden platform on the right shore 20 feet above gauging station. Zero of the gauge (elev. 27.09 feet) is referred to a bench mark (elev. 35.00 feet) painted on top of 5-ft. iron pipe 20 feet above gauging station.

Channel and Control—Straight for about 200 feet above and 100 feet below the gauging station to the falls. The banks are high and wooded, and are not liable to overflow. The bed of the stream is composed of clay and a few rocks, practically permanent. The velocity is moderate.

Discharge Measurements—Made by wading with a small Price current meter.

Accuracy—The rating curve is fairly well defined between limits, for which gauge height records are available.

Observer—Henry Stroud, Burk's Falls.

Discharge Measurements of Maganetawan River (North Branch) near Burk's Falls in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 10,	Murray, W. S. ..	47	99	1.41	29.64	140	.....
1916							
Jan. 17,	"	40	68	1.60	29.77	109 (a)	.....
Feb. 15,	"	49	91	2.19	30.34	199 (a)	.....
Mar. 13,	"	46	80	1.41	29.88	114 (a)	.....
Apl. 12,	"	60	197	3.25	31.54	642 (b)	.....
May 15,	"	60	182	2.44	31.00	444	.....
June 20,	"	55	139	2.01	30.42	280	.....
Aug. 30,	"	36	50	.50	25.70	26	.....
Oct. 11,	"	38	72	1.09	29.42	78	.....

(a) Ice measurement.
(b) Logs on control.

Daily Gauge Height and Discharge of Maganetawan River (North Branch) near Burk's Falls for 1915-6

Drainage Area, 107. Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge			
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.	Feet
1	29.84	168	30.25	262	29.50	100	31.17	520	29.96	134	31.50	620	31.67	670	30.63	358	30.09	199	29.09	44	28.75	26	29.46	82												
2	29.75	150	30.34	285	29.50	100	31.17	520	29.84	114	31.91	760	31.59	640	30.67	370	30.04	199	29.00	38	28.79	27	29.42	77												
3	29.71	142	30.34	285	29.50	100	31.17	520	29.75	88	32.09	820	31.59	640	30.75	392	30.09	186	28.96	36	28.80	27	29.42	77												
4	29.75	150	30.34	285	29.50	100	31.17	520	29.67	82	32.67	1020	31.59	640	31.00	466	30.00	176	28.92	33	28.92	33	29.42	77												
5	29.67	134	30.29	272	29.63	126	31.09	497	29.75	88	32.67	1020	31.50	615	30.92	443	29.92	158	28.88	31	29.34	67	29.38	72												
6	29.71	142	30.25	262	29.55	110	31.09	470	29.79	100	32.59	995	31.42	590	30.84	419	29.84	141	28.84	29	29.34	67	29.25	57												
7	29.71	142	30.17	242	29.50	100	31.00	410	29.84	100	32.34	910	31.42	590	30.75	393	29.75	124	28.88	31	29.38	72	29.17	51												
8	29.63	126	30.25	262	29.59	100	30.84	380	29.84	100	32.00	790	31.38	580	30.71	381	29.75	112	28.92	33	29.38	72	29.17	51												
9	29.67	134	30.25	262	29.59	100	30.75	350	29.84	100	31.75	700	31.34	565	30.59	346	29.67	112	28.92	33	29.42	77	29.21	54												
10	29.67	134	30.25	262	29.59	100	30.75	350	29.88	100	31.84	735	31.42	590	30.50	319	29.67	112	28.92	33	29.42	77	29.34	67												
11	29.75	150	30.25	262	29.59	100	30.67	312	29.88	110	31.88	750	31.25	540	30.50	319	29.63	105	28.88	31	29.42	77	29.44	79												
12	29.75	150	30.25	262	29.59	100	30.67	312	29.88	110	31.67	675	31.25	540	30.50	319	29.59	100	28.84	29	29.38	72	29.44	79												
13	29.75	150	30.09	222	29.63	100	30.50	250	29.88	110	31.50	620	31.17	515	30.59	346	29.55	94	28.84	29	29.34	67	29.44	79												
14	29.67	134	30.00	200	29.67	100	30.38	200	29.88	110	31.92	760	31.09	490	30.67	370	29.50	87	28.84	29	29.25	58	29.44	79												
15	29.63	126	29.92	184	29.67	100	30.34	200	29.88	110	32.17	850	31.00	466	30.71	381	29.46	82	28.84	29	29.09	44	29.46	82												
16	29.42	88	29.84	168	29.67	100	30.29	200	29.88	110	32.42	885	30.96	455	30.75	393	29.42	77	28.84	29	28.84	29	29.50	87												
17	29.09	44	29.80	160	29.67	100	30.30	190	29.88	110	32.75	980	30.96	455	30.75	393	29.42	77	28.84	29	28.67	23	29.50	87												
18	29.42	88	29.75	150	29.71	104	30.25	180	29.88	110	32.92	1030	30.96	455	30.75	393	29.34	67	28.84	29	28.75	26	29.59	100												
19	29.67	134	29.75	150	29.75	110	30.25	180	29.88	110	33.17	1100	31.00	466	30.75	393	29.25	58	28.84	29	28.84	29	29.75	124												
20	29.67	134	29.75	150	29.84	134	30.25	184	29.88	110	33.00	1050	31.04	478	30.42	295	29.17	51	28.84	29	29.00	38	29.92	158												
21	29.67	134	29.67	134	29.67	130	30.25	184	29.79	100	32.67	955	31.09	490	30.59	346	29.30	63	28.84	29	29.09	44	30.67	370												
22	29.67	134	29.59	118	30.42	250	30.25	184	29.75	100	32.75	980	31.09	490	30.59	346	29.38	72	28.84	29	30.09	199	30.75	392												
23	29.67	134	29.59	118	30.38	250	30.17	170	29.71	100	32.54	920	31.09	490	30.50	319	29.34	67	28.82	28	30.09	199	30.80	407												
24	29.75	150	29.59	118	30.38	250	30.25	184	29.71	100	33.09	1080	31.00	490	30.42	295	29.34	67	28.80	27	29.92	158	31.09	492												
25	29.84	168	29.59	118	30.50	275	30.09	160	29.75	104	32.54	920	31.04	478	30.42	295	29.30	63	28.80	27	29.75	124	31.09	492												
26	29.84	168	29.59	118	30.50	275	30.09	160	29.75	150	32.42	885	31.00	466	30.38	283	29.25	58	28.80	27	29.34	67	31.17	515												
27	30.09	222	29.59	118	30.75	395	30.00	140	30.00	200	32.34	860	31.00	466	30.38	283	29.25	58	28.79	27	29.34	67	31.21	530												
28	30.46	315	29.55	110	30.92	446	29.96	134	30.25	262	32.09	785	30.92	443	30.30	259	29.21	54	28.79	27	29.38	72	31.25	540												
29	30.59	348	29.55	110	31.09	497	29.96	134	30.67	371	31.75	685	30.84	419	30.25	245	29.21	54	28.75	26	29.42	77	31.25	540												
30	30.42	305	29.55	110	31.17	520	.....	.....	31.00	470	31.59	640	30.75	893	30.17	221	29.17	51	28.75	26	29.42	77	31.25	540										
31	.....	.....	29.55	110	31.17	520	.....	.....	31.17	520	.....	.....	30.59	846	.....	.....	29.13	47	28.75	26	.....	.....	31.25	540		

Monthly Discharge of Maganetawan River (North Branch) near Burk's Falls for 1915-6

Drainage Area, 107 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915).	348	44	166	3.25	.44	1.55	1.73
December ..	285	110	189	2.66	1.03	1.77	2.04
January .. (1916).	520	100	190	4.86	.93	1.78	2.05
February	520	134	282	4.86	1.25	2.64	2.84
March	520	82	148	4.86	.77	1.38	1.59
April.....	1,100	620	859	10.28	5.79	8.03	8.96
May.....	670	346	515	6.26	3.23	4.81	5.55
June	466	221	346	4.36	2.07	3.23	3.60
July.....	199	47	96	1.86	.44	.90	1.04
August	44	26	30	.41	.24	.28	.32
September	199	23	70	1.86	.21	.65	.73
October.....	540	51	225	5.05	.48	2.10	2.42
The year	1,100	23	259	10.28	.21	2.42	32.94

Maganetawan River (South Branch) near Burk's Falls

Location—One-half mile south of Burk's Falls station, and 200 feet east of G.T. Ry. tracks on lot 8, concession 8, Township of Armour, Parry Sound District.

Records Available—Discharge measurements from June, 1915, to October, 1916. Daily gauge heights from August 1, 1915, to October 31, 1916.

Drainage Area—257 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, fastened to 2 x 8 scantling wedged between two hardwood trees on the left shore 20 feet above gauging station. Zero of the gauge (elev. 22.00 feet) is referred to a bench mark (elev. 35.00 feet) painted on top of a 5-ft. iron pipe located near the gauge on the north branch of the river.

Channel and Control—Straight for about 250 feet above and 500 feet below the rapids. The banks are high and wooded, and are not liable to overflow. The current is moderate.

Discharge Measurements—Made by wading with a small price meter.

Regulation—Temporary dams above, which are used during log driving season, cause fluctuations at the gauge.

Accuracy—Rating curve fairly well defined between gauge heights 23.50 and 24.00 feet. There are not sufficient data available to define a good curve above and below these limits.

Observer—Henry Stroud, Burk's Falls.

Discharge Measurements of Maganetawan River (South Branch) near Burk's Falls in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 10....	Murray, W. S ...	65	132	2.13	24.00	283	.....
1916							
Feb. 15....	"	70	178	3.06	24.70	546 (a)	.....
Mar. 13....	"	67	126	2.34	23.92	294 (b)	.....
April 5....	"	77	242	4.51	25.52	1,090	.....
May 15....	"	77	249	3.48	25.66	866	.....
June 20....	"	78	210	3.18	25.14	670	.....
Aug. 30....	"	62	81	1.74	23.37	142	.....
Oct. 11....	"	64	88	1.71	23.49	151	.....

(a) River ice-covered above section.

(b) Floating ice at section.

Daily Gauge Height and Discharge of Maganetawan River (South Branch) near Burk's Falls for 1915-6
Drainage Area 257 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.	
1	24.16	346		24.16	346		24.16	346		24.75	605		24.29	396		25.03	780		26.35	1610		25.37	815		25.00	685		23.25	114		23.41	151		23.66	229	
2	24.12	352		24.12	352		24.12	352		24.83	645		24.16	346		25.16	825		26.25	1555		25.33	790		25.00	685		23.25	114		23.45	162		23.62	216	
3	24.08	318		24.08	318		24.08	318		24.91	685		24.16	346		25.58	1085		26.25	1555		25.33	790		24.91	650		23.25	114		23.45	162		23.60	209	
4	24.16	346		24.16	346		24.08	318		24.83	645		24.16	346		25.41	975		26.25	1555		25.37	815		24.83	625		23.25	114		23.41	151		23.58	202	
5	24.08	318		24.37	428		24.37	428		24.83	645		24.16	346		25.62	1115		26.21	1525		25.33	790		24.75	600		23.25	114		23.33	132		23.58	202	
6	24.00	290		24.20	360		24.37	428		24.87	665		24.16	346		25.66	1140		26.21	1525		25.25	770		24.66	570		23.25	114		23.33	132		23.58	202	
7	24.08	318		24.25	380		24.58	320		24.91	685		24.16	346		25.71	1175		26.00	1380		25.25	770		24.58	540		23.25	123		23.33	132		23.54	189	
8	24.08	318		24.25	380		24.42	448		24.83	645		24.16	346		25.79	1205		26.00	1380		25.21	755		24.58	540		23.33	132		23.33	132		23.54	189	
9	24.00	290		24.25	380		24.37	428		24.83	645		24.00	290		25.66	1140		25.91	1315		25.21	755		24.54	530		23.33	132		23.33	132		23.50	176	
10	24.00	290		24.25	380		24.00	290		24.83	645		24.04	304		25.71	1175		25.91	1315		25.25	770		24.50	515		23.33	132		23.33	132		23.50	176	
11	24.00	290		24.33	412		24.00	290		24.75	605		23.95	278		25.79	1235		25.83	1260		25.25	770		24.46	500		23.33	132		23.33	132		23.48	171	
12	24.08	318		24.33	412		24.08	318		24.66	560		23.91	268		25.83	1260		25.75	1205		25.25	770		24.37	470		23.33	132		23.33	132		23.50	176	
13	24.02	297		24.25	380		24.00	290		24.70	580		23.91	268		26.00	1380		25.66	1140		25.25	770		24.37	470		23.37	141		23.33	132		23.50	176	
14	24.00	290		24.16	346		24.00	290		24.75	605		23.91	268		26.08	1435		25.66	1140		25.29	780		24.33	457		23.45	162		23.41	151		23.50	176	
15	24.00	290		24.16	346		24.08	318		24.75	605		23.91	268		26.08	1435		25.66	1140		25.29	780		24.33	457		23.45	162		23.41	151		23.50	176	
16	24.00	290		24.16	346		24.08	318		24.66	560		23.91	268		26.08	1435		25.66	1140		25.29	780		24.33	457		23.45	162		23.41	151		23.50	176	
17	23.95	278		24.12	332		24.16	346		24.67	565		23.87	258		26.25	1555		25.50	1190		25.37	815		24.37	470		23.52	183		23.62	216		23.58	202	
18	24.00	290		24.08	318		24.16	346		24.62	540		23.83	249		26.25	1555		25.83	960		25.29	780		23.46	165		23.46	165		23.58	202		23.62	216	
19	24.00	290		24.08	318		24.08	318		24.58	520		23.83	249		26.41	1665		25.87	980		25.16	735		23.46	165		23.46	165		23.58	202		23.75	260	
20	24.00	290		24.08	318		24.08	318		24.58	520		23.83	249		26.41	1665		25.87	980		25.16	735		23.46	165		23.46	165		23.58	202		23.83	287	
21	24.00	290		24.08	318		24.08	318		24.50	480		24.58	254		26.33	1610		26.16	1070		25.16	735		23.50	176		23.50	176		23.58	202		24.00	345	
22	24.00	290		24.08	318		24.16	346		24.50	480		24.50	260		26.41	1665		26.50	1190		25.08	710		23.46	165		23.46	165		23.58	202		24.00	345	
23	24.00	290		24.08	318		24.29	396		24.41	444		24.41	265		26.41	1665		26.33	1180		25.04	695		23.41	151		23.50	176		23.58	202		24.08	371	
24	24.00	290		24.04	304		24.25	380		24.41	444		24.25	295		26.41	1665		26.00	1020		25.00	685		23.41	151		23.50	176		23.58	202		24.16	399	
25	24.00	290		24.04	304		24.33	412		24.41	444		24.25	380		26.41	1665		25.91	990		25.00	685		23.41	151		23.50	176		23.58	202		24.33	457	
26	24.00	290		24.08	318		24.33	412		24.33	412		24.29	396		26.37	1640		25.41	820		25.00	685		23.39	146		23.50	176		23.58	202		24.41	483	
27	24.04	304		24.04	304		24.33	412		24.29	396		24.29	396		26.33	1610		25.33	790		25.00	685		23.33	132		23.50	176		23.58	202		24.66	555	
28	24.08	318		24.12	332		24.50	480		24.29	396		24.53	412		26.33	1610		25.33	790		25.04	695		23.33	132		23.50	176		23.58	202		24.83	625	
29	24.16	346		24.12	332		24.62	540		24.29	396		24.58	520		26.29	1585		25.37	815		25.00	685		23.27	118		23.25	114		23.62	216		24.91	650	
30	24.08	318		24.12	332		24.66	560		.....	.....		24.75	605		26.25	1555		25.41	820		25.00	685		23.25	114		23.33	132		23.66	229		25.08	710	
31	.....	.....		24.16	346		24.66	560		.....	.....		24.91	685		.....	.....		25.45	835		.....	.....		23.25	114		23.41	151		.....	.....		25.12	725	

Monthly Discharge of Maganetawan River (South Branch) near Burk's Falls for 1915-6

Drainage Area, 257 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915).	346	278	304	1.35	1.08	1.18	1.32
December. . .	412	304	348	1.60	1.18	1.35	1.56
January ..(1916).	560	290	381	2.18	1.13	1.48	1.71
February	685	396	555	2.67	.54	2.16	2.33
March.....	685	249	339	2.67	.97	1.32	1.52
April.....	1,665	780	1,379	6.48	3.04	5.37	5.99
May.....	1,610	790	1,173	6.26	3.07	4.56	5.26
June	815	685	750	3.17	2.67	2.92	3.26
July.....	685	114	364	2.67	.44	1.42	1.64
August	202	96	149	.78	.37	.58	.67
September.....	229	132	171	.89	.51	.67	.75
October.....	725	171	312	2.82	.67	1.21	1.39
The year	1,665	132	517	6.48	.51	2.01	27.36

Mississagi River at Iron Bridge

Location—At highway bridge in the village of Iron Bridge, south half of lot 3, concession 2, Township of Gladstone, District of Algoma.

Records Available—Discharge measurements from September, 1915, to October, 1916. Daily gauge heights from November 16, 1915, to October 31, 1916.

Drainage Area—3,565 square miles.

Gauge—Vertical steel staff with enamelled face graduated in feet and inches, 0 to 6 foot section placed on pile on left shore 350 feet down stream from bridge, 6 to 12 foot section placed on down stream side of right abutment of bridge. Zero on the gauge (elev. 32.00 feet) referred to bench mark (elev. 55.50 feet) on top of right abutment on down stream side, painted thus "B.M. 55.50."

Channel—Straight for about 300 feet above and about 1 mile below the gauging station. The bed of the stream consists of clay and sand, slightly shifting.

Discharge Measurements—Made from highway bridge with small Price current meter.

Control—About eleven miles below the gauging station there is a small falls and rapids known as the Mississagi rapids. Log jams sometimes occur on these rapids during low water period, which may cause back water at the gauging station.

Winter Flow—During the winter months measurements are made through the ice to determine the winter flow. The relation of gauge height to discharge is seriously affected by ice.

Observer—Lorne Arnill, Iron Bridge.

Discharge Measurements of Mississagi River at Iron Bridge in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 16....	Murray, W. S...	177	3,117	2.09	36.09	6,515	.....
Dec. 3....	"	183	3,513	2.42	38.25	8,550	.....
1916							
Feb. 8....	"	170	2,705	.94	33.50	2,520(a)	.....
Mar. 8....	"	150	2,174	.63	33.00	1,366(a)	.....
Aug. 23....	"	160	2,288	.62	31.25	1,430	.....
Oct. 19....	"	165	2,464	1.02	32.39	2,516	.....

(a) Ice measurement.

Monthly Discharge of Mississagi River at Iron Bridge for 1915-6

Drainage Area 3565 Square Miles.

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
Nov. 15-30, (1915)	9,380	5,100	6,595	2.63	1.43	1.85	1.03
December	8,950	4,060	6,522	2.51	1.14	1.83	2.11
January .. (1916)	4,350	2,750	3,378	1.22	.77	.95	1.10
February.....	3,050	1,350	2,237	.86	.38	.63	.68
March.....	3,760	1,330	1,805	1.05	.37	.51	.59
April.....	13,300	4,090	8,238	3.73	1.15	2.31	2.58
May	12,300	7,100	9,028	3.45	1.99	2.53	2.92
June	8,860	5,350	7,160	2.49	1.50	2.01	2.24
July.....	6,850	2,170	4,302	1.92	.61	1.21	1.39
August.....	2,090	1,170	1,697	.59	.33	.48	.55
September.....	2,830	1,090	1,878	.79	.31	.53	.59
October	7,530	1,840	3,817	2.11	.52	1.07	1.23
The period.....	13,300	1,090	4,641	3.45	.31	1.30	17.70

Muskoka River (North Branch) near Port Sydney

Location—At the highway bridge near the Village of Port Sydney and ¼ mile below Mary Lake, on lot 25, concession 5, Township of Stephenson, Muskoka District.

Records Available—Discharge measurements from April, 1915, to October, 1916. Daily gauge heights from April 16, 1915, to Oct. 31, 1916.

Drainage Area—560 square miles.

Gauge—Vertical steel staff with enamelled face graduated in feet and inches and fastened to abutment on left upstream side of bridge. Zero of gauge (elev. 7.00 feet) is referred to a bench mark (elev. 24.78 feet) painted on top of right abutment, downstream side.

Channel—Straight for about 1,500 feet above and 500 feet below gauging station. Both banks are high, wooded, and not liable to overflow. The bed of the channel is composed of clay and gravel.

Discharge Measurements—Made from highway bridge with a small Price current meter.

Regulation—The operation of dam at Mary Lake during certain periods of the year will cause fluctuation at the gauge.

Accuracy—The rating curve is fairly well defined, and estimates of discharge are fair.

Observer—A. E. McInnes, Port Sydney.

Discharge Measurements of Muskoka River (North Branch) near Port Sydney in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 11....	Murray, W. S..	53	302	1.86	8.58	563	.....
Dec. 23....	" ..	52	308	1.72	8.66	533	.....
1916							
Jan. 19....	Murray, W. S...	50	292	1.55	8.41	452(a)	.....
Feb. 17....	" ..	53	313	2.24	8.80	704	.....
Mar. 16....	" ..	48	293	1.67	8.52	495	.....
Apr. 11....	" ..	58	444	5.90	11.16	2,622	.....
" 29....	" ..	58	499	7.12	12.00	3,552	.....
May 23....	" ..	55	366	3.77	9.75	1,482	.....
June 22....	" ..	55	331	3.09	9.34	1,023	.....
July 11....	" ..	47	260	.62	7.85	163	.....

(a) River ice-covered below section.

Daily Gauge Height and Discharge of Muskoka River (North Branch) near Port Sydney for 1915-6
Drainage Area, 560 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.	Gauge Ht. Feet	Dis- charge Sec-ft.
1	8.41	446	9.41	1130	8.66	605	10.62	2060	8.41	446	11.08	2440	10.91	2290	9.25	1010	9.00	840	7.83	125	7.71	88	7.83	125
2	8.41	446	9.41	1130	8.66	605	10.58	2020	8.41	446	10.95	2320	11.41	2740	9.25	1010	9.00	840	7.83	125	7.71	88	7.83	125
3	8.41	446	9.41	1130	8.66	605	10.58	2020	8.41	446	10.83	2220	11.41	2740	9.58	1260	9.00	840	7.83	125	7.71	88	7.83	125
4	8.41	446	9.41	1130	8.66	605	10.41	1890	8.50	500	10.83	2220	11.33	2670	9.50	1200	8.91	775	7.83	125	7.71	88	7.83	125
5	8.83	720	9.41	1130	8.33	400	10.33	1820	8.50	500	10.83	2220	11.16	2510	9.29	1040	8.91	775	7.83	125	8.33	398	7.83	125
6	8.83	720	9.41	1130	8.33	400	10.25	1760	8.50	500	11.58	2900	11.16	2510	9.08	895	8.50	620	7.83	125	8.25	350	7.71	88
7	8.83	720	9.41	1130	8.33	400	10.16	1700	8.66	605	12.66	4140	11.00	2370	9.25	1010	8.50	500	8.83	125	8.16	296	7.71	88
8	8.58	550	9.16	950	8.33	400	10.16	1700	8.37	422	12.66	4140	11.00	2370	9.25	1010	8.16	296	8.83	720	7.91	155	7.83	125
9	8.58	550	9.16	950	8.33	400	10.08	1630	8.41	446	11.33	2670	10.58	2020	9.33	1070	7.83	125	8.83	720	7.83	125	7.83	125
10	8.58	550	9.00	840	8.33	400	10.08	1630	8.50	500	11.16	2510	10.33	1820	9.29	1040	7.83	125	8.25	350	7.54	53	7.91	155
11	8.58	550	9.00	840	8.66	605	9.91	1510	8.50	500	11.16	2510	10.08	1630	8.91	775	7.83	125	8.25	350	7.66	77	7.91	155
12	8.58	550	8.16	296	8.66	605	9.50	1200	8.50	500	11.16	2510	10.00	1575	8.70	630	7.83	125	8.08	249	7.70	85	7.85	132
13	8.58	550	8.16	296	8.66	605	9.42	1140	8.50	500	11.75	3070	8.83	720	8.50	500	7.87	140	7.91	155	7.75	100	7.87	140
14	8.58	550	8.16	296	8.66	605	9.41	1130	8.50	500	11.75	3070	9.33	1070	8.58	550	7.87	140	7.75	100	7.75	100	7.87	140
15	8.58	550	8.16	296	8.66	605	9.04	870	8.50	500	12.25	3620	9.83	1450	8.75	665	7.91	155	7.75	100	7.75	100	7.87	140
16	8.58	550	8.16	296	8.66	605	8.75	665	8.50	500	12.16	3520	10.62	2060	9.33	1070	7.91	155	7.75	100	7.83	125	8.08	249
17	7.83	129	8.41	446	8.41	446	8.83	720	8.50	500	12.20	3560	10.50	1960	9.50	1200	8.00	205	7.83	125	7.83	125	8.16	296
18	7.83	129	8.41	446	8.41	446	8.75	665	8.50	500	12.50	3930	10.37	1860	9.75	1290	8.00	205	7.83	125	7.83	125	8.16	296
19	8.58	550	8.16	296	8.41	446	8.41	446	8.41	446	12.50	3930	10.33	1820	9.91	1510	8.62	580	7.83	125	7.83	125	8.45	470
20	8.58	550	8.16	296	8.41	446	8.41	446	8.41	446	12.83	4360	9.91	1510	9.33	1070	8.08	249	7.83	125	7.83	125	8.45	470
21	8.58	550	8.66	605	8.41	446	8.50	500	8.25	350	12.33	3720	9.91	1510	9.33	1070	8.58	550	7.83	125	7.83	125	8.46	476
22	8.58	550	8.66	605	8.45	470	8.56	500	8.25	350	12.83	4360	9.91	1510	9.33	1070	8.58	550	7.83	125	7.83	125	8.41	446
23	8.58	550	8.66	605	9.08	895	8.50	500	8.25	350	12.66	4140	9.91	1510	9.33	1070	8.25	350	7.66	77	7.83	125	9.41	1130
24	9.16	950	8.66	605	9.33	1070	8.50	500	8.25	350	12.66	4140	9.75	1390	9.33	1070	7.91	155	7.66	77	7.83	125	9.50	1200
25	9.16	950	8.66	605	9.33	1070	8.75	665	8.25	350	12.58	4030	9.75	1390	9.41	1130	7.83	125	7.66	77	7.83	125	9.54	1230
26	9.16	950	8.66	605	9.37	1100	8.75	665	8.25	350	12.50	3930	9.75	1390	9.37	1100	7.83	125	7.66	77	7.83	125	9.78	1410
27	9.16	950	8.66	605	9.70	1350	8.58	550	8.25	350	12.37	3760	9.75	1390	9.00	840	7.83	125	7.66	77	7.83	125	10.08	1630
28	9.41	1130	8.66	605	10.41	1890	8.58	550	8.70	630	12.33	3720	9.83	1450	9.00	840	7.83	125	7.66	77	7.83	125	10.00	1370
29	9.41	1130	8.66	605	10.58	2020	8.58	550	8.75	665	12.04	3380	9.08	895	9.00	840	7.58	61	8.00	205	7.83	125	9.91	1510
30	9.41	1130	8.66	605	10.66	2090	8.58	550	8.75	665	11.00	2370	9.41	1130	9.00	840	7.58	61	7.71	88	7.83	125	9.91	1510
31	.....	.....	8.66	605	10.66	2090	.....	.....	10.53	1980	.....	.....	9.41	1130	.....	.....	7.62	69	7.71	88	.....	.....	9.62	1290

Monthly Discharge of Muskoka River (North Branch) near Port Sydney for 1915-6

Drainage Area 560 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	1,130	129	636	2.02	.23	1.14	1.27
December. "	1,130	296	681	2.02	.53	1.22	1.41
January .. (1916)	2,090	400	798	3.73	.71	1.42	1.64
February	2,060	446	1,104	3.68	.80	1.97	2.12
March	2,370	350	573	4.23	.62	1.02	1.18
April	4,360	2,220	3,206	7.79	3.96	5.72	6.33
May	2,740	720	1,746	4.89	1.29	3.12	3.60
June	1,510	500	998	2.70	.89	1.78	1.99
July	840	61	326	1.50	.11	.58	.67
August	720	77	194	1.29	.14	.35	.40
September	398	53	136	.71	.09	.24	.27
October	1,570	88	552	2.80	.16	.99	1.14
The year	4,360	53	908	7.79	.09	1.62	21.95

Muskoka River (South Branch) at Tretheway's Falls

Location—At small steel highway bridge known as Tretheway's Falls Bridge, about 1 mile south of the Muskoka Falls Post Office, and about 7 miles south of the Town of Bracebridge, Township of Draper, Muskoka District.

Records Available—Discharge measurements, August, 1912, to October, 1916. Daily gauge heights, June 4, 1914, to October 31, 1916.

Drainage Area—668 square miles.

Gauge—As there is no available place for establishing a permanent staff gauge, a bench mark (elevation 25.00), painted on a stringer, on the up-stream side of the bridge, is used in ascertaining the water elevation, by measuring down to the surface of the stream with a graduated staff. It is referred to a bench mark (elevation 33.08) painted on a large rock on the right bank, 90 feet to the right of the downstream side of the bridge.

Channel and Control—Straight for about 300 feet above and 300 feet below the station. The banks are fairly high, rocky and wooded and will not overflow. The current is very swift and the bed of stream is rough and rocky, with a heavy slope about 250 feet below the section.

Discharge Measurements—Made from the upstream side of the bridge with a Price current meter and a stay line.

Winter Flow—The gauge is located where the current is swift and ice seldom forms across the river for the entire width. The relation of gauge height to discharge is but slightly affected by ice.

Accuracy—Measurements made at Black's Bridge 1 mile above, were used in conjunction with those made at Tretheway's Falls, and a fairly well-defined rating curve has been established. Open water curve used throughout the year.

Observer—Wesley Morrow, Muskoka Falls.

Discharge Measurements of Muskoka River at Tretheway's Falls in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 9....	Murray, W. S...	50	174	3.45	13.92	602	.....
Dec. 15....	"	50	193	3.33	14.00	644 (a)	.....
1916							
Jan. 19....	"	49	198	3.53	14.48	700 (a)	.....
Feb. 17....	"	50	211	4.89	14.75	1,032	.....
Mar. 15....	"	50	230	5.44	15.17	1,251	.....
April 11....	"	89	1,595	1.23	16.25	1,940 (b)	.....
" 28....	"	125	1,960	2.21	19.34	4,338 (c)	.....
May 17....	"	89	1,657	1.50	17.00	2,569 (c)	.....
June 22....	"	91	1,665	1.17	16.25	1,958 (c)	.....
July 13....	"	89	1,390	.56	14.50	781 (c)	.....
" 13....	"	49	198	4.57	14.50	908	.....
Oct. 12....	"	42	129	2.55	12.92	330	.....

(a) River ice-covered above section.

(b) Reading taken at Black's Bridge. Logs in stream.

(c) Reading taken at Black's Bridge.

Daily Gauge Height and Discharge of Muskoka River (South Branch) at Tretheway's Falls for 1915-16
Drainage Area, 668 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	14.00	580	14.34	700	14.09	610	16.00	1560	14.59	935	15.50	1460	19.00	4050	16.17	1910	15.50	1460	13.84	565	13.17	385	13.17	385
2	14.00	580	14.34	700	14.09	610	16.25	1710	14.50	890	16.00	1790	19.00	4050	16.09	1850	14.67	975	13.84	565	13.17	385	13.17	385
3	14.00	580	14.34	700	14.09	610	16.00	1560	14.50	890	16.00	1790	19.00	4050	15.84	1710	14.50	890	13.84	565	13.17	385	13.17	385
4	13.92	550	14.34	700	14.09	610	16.00	1560	14.50	890	16.00	1790	19.00	4050	15.50	1460	14.59	935	13.84	565	13.17	385	13.17	385
5	13.92	550	14.34	700	14.09	610	16.25	1710	14.50	890	16.00	1790	19.00	4050	16.00	1790	14.59	935	13.84	565	13.17	385	13.17	385
6	13.92	550	14.25	665	14.17	640	16.50	2140	15.00	1160	16.25	1960	18.67	3790	16.50	2140	14.59	890	13.67	501	13.17	385	13.09	374
7	13.92	550	14.17	640	14.17	640	16.50	2140	14.59	935	16.50	2140	18.50	3650	17.00	2490	14.50	890	13.50	450	13.17	385	13.09	374
8	13.92	550	14.17	640	14.17	640	16.00	1790	14.59	935	16.67	2260	18.50	3650	17.50	2860	14.50	890	13.34	413	13.17	385	13.09	374
9	13.92	550	14.17	640	14.09	610	16.00	1790	14.75	1020	16.67	2260	18.50	3650	17.50	2860	14.50	890	13.34	413	13.17	385	13.09	374
10	13.92	550	14.17	640	14.09	610	16.00	1790	15.00	1160	17.00	2490	18.17	3390	17.34	2740	14.50	890	13.25	398	13.17	385	13.09	374
11	13.92	550	14.17	640	14.17	640	15.92	1730	16.00	1790	17.25	2680	18.00	3250	17.34	2740	14.42	850	13.25	398	13.17	385	13.09	374
12	13.92	550	14.09	610	14.17	640	15.84	1680	15.75	1620	17.75	3050	17.50	2865	17.17	2620	14.34	810	13.17	385	13.17	385	13.00	365
13	13.92	550	14.09	610	14.09	610	15.67	1560	15.50	1460	17.75	3050	17.17	2620	16.67	2260	14.34	810	13.25	398	13.17	385	13.00	365
14	13.92	550	14.09	610	14.09	610	15.67	1560	15.50	1460	18.00	3250	17.25	2680	16.50	2140	14.34	810	13.25	398	13.17	385	13.00	365
15	13.92	550	14.09	610	14.09	610	15.50	1460	15.50	1460	18.25	3450	17.34	2740	16.34	2030	14.34	810	13.25	398	13.17	385	13.00	365
16	13.84	525	14.09	610	14.09	610	15.17	1260	15.25	1310	18.50	3650	17.50	2865	16.67	2260	14.34	810	13.25	398	13.17	385	13.00	365
17	13.84	525	14.09	610	14.09	610	15.17	1260	15.25	1310	18.50	3650	17.50	2865	16.67	2260	14.34	810	13.25	398	13.17	385	13.00	365
18	13.84	525	14.00	580	14.09	610	14.84	1060	15.00	1160	18.67	3790	17.25	2680	16.67	2260	14.25	765	13.25	398	13.17	385	13.09	374
19	13.84	525	14.00	580	14.09	610	14.84	1060	15.00	1160	18.67	3790	17.25	2680	16.67	2260	14.25	765	13.25	398	13.17	385	13.09	374
20	14.17	640	14.00	580	14.00	580	14.67	975	15.00	1160	18.67	3790	17.25	2680	16.67	2260	14.25	765	13.25	398	13.17	385	13.17	385
21	14.00	580	14.09	610	14.00	580	14.67	975	15.00	1160	18.67	3790	17.00	2490	16.42	2080	14.25	765	13.25	398	13.17	385	13.25	398
22	14.00	580	14.09	610	14.09	610	14.75	865	14.59	935	18.84	3920	17.00	2490	16.25	1960	14.34	810	13.25	398	13.17	385	13.34	413
23	14.00	580	14.09	610	15.09	1040	14.58	930	14.50	890	18.50	3650	17.00	2490	16.25	1960	14.34	810	13.25	398	13.17	385	13.34	413
24	13.92	550	14.09	610	15.09	1040	14.50	890	14.50	890	18.50	3650	17.00	2490	16.17	1910	14.25	765	13.25	398	13.17	385	13.34	413
25	14.00	580	14.09	610	15.00	995	14.50	890	14.00	660	19.00	4050	17.00	2490	16.00	1790	14.25	765	13.17	385	13.17	385	13.42	430
26	14.00	580	14.09	610	15.00	995	14.50	890	14.00	660	19.34	4240	17.00	2490	16.00	1790	14.25	765	13.17	385	13.17	385	13.42	430
27	14.00	580	14.09	610	15.50	1260	14.50	890	14.00	660	19.50	4470	17.00	2490	16.00	1790	14.25	765	13.17	385	13.17	385	13.50	450
28	14.00	580	14.09	610	15.50	1260	14.50	890	14.00	660	19.50	4470	17.00	2490	16.25	1960	14.00	685	13.17	385	13.17	385	13.50	450
29	14.34	700	14.09	610	15.25	1130	14.50	890	14.25	765	19.34	4240	17.00	2490	16.50	2140	14.00	640	13.17	385	13.09	374	13.59	477
30	14.34	700	14.09	610	15.25	1130	14.50	890	14.34	810	19.00	4050	17.00	2490	16.17	1910	14.00	640	13.17	385	13.09	374	13.59	477
31	.....	....	14.09	610	16.00	1560	.....	.....	14.45	865	.....	.....	16.50	2140	15.75	1610	13.92	600	13.17	385	13.09	374	13.59	477
									14.84	1060	.....	.....	16.34	2030	.....	.....	13.84	565	13.17	385	.....	.....	13.59	477

Monthly Discharge of Muskoka River (South Branch) at Tretheway's Falls in 1915-6

Drainage Area, 668 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	700	525	574	1.05	.79	.86	.96
December "	700	580	628	1.05	.87	.94	1.08
January .. (1916)	1,560	580	787	2.34	.87	1.18	1.36
February	2,140	890	1,405	3.20	1.33	2.10	2.27
March	1,790	660	1,099	2.68	.99	1.65	1.90
April	4,470	1,460	3,110	6.69	2.19	4.66	5.20
May	4,190	2,030	3,000	6.27	3.04	4.49	5.18
June	2,860	1,610	2,142	4.28	2.41	3.21	3.58
July	1,460	565	824	2.19	.84	1.23	1.42
August	565	385	426	.84	.58	.64	.74
September	385	374	382	.58	.56	.57	.64
October	477	365	401	.71	.55	.60	.69
The year	4,470	365	1,227	6.69	.55	1.84	25.02

Seguin River near Parry Sound

Location—700 feet below Mountain Dam, two miles above the highway bridge, and about seven miles above the Town of Parry Sound, Township of McDougall, Parry Sound District.

Records Available—Discharge measurements from June, 1914, to October, 1916. Daily gauge heights from August 1, 1915, to October 31, 1916.

Drainage Area—380 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, firmly wedged in rock on left shore 200 feet below dam. Zero of gauge (elev. 8.00 feet) is referred to a bench mark (elev. 15.00 feet) painted on a large rock directly across stream from gauge.

Channel—Both banks are high, wooded and not liable to overflow. The bed of the stream is composed of rocks and boulders, slightly shifting. The current is swift, and flows through one channel at all stages.

Discharge Measurements—Made by wading with a Price current meter. During high water, measurements are made at the highway bridge at the head of Mill Lake, 2 miles below wading section.

Regulation—The dam 700 feet above gauging station causes fluctuation of river at gauge.

Winter Flow—Ice forms along the banks of river at the station during the winter months. The river is entirely covered with ice for a considerable distance above and below station.

Accuracy—Discharges for gauge heights below 10.6 feet are considered fair. Rating curve above this point not very well defined.

Observer—Percy Burnside, Parry Sound.

Discharge Measurements of Seguin River near Parry Sound in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Dec. 14,	Murray, W. S....	63	538	1.23	11.61	665(a)	.....
1916							
Feb. 16,	"	63	553	1.65	12.62	916(a)	.....
Mar. 14	"	63	364	.72	11.12	262(b)	.....
April 10	"	63	551	5.00	13.00	2,857(a)	.....
May 16	"	63	516	2.65	12.39	1,369(a)	.....
June 21	"	63	494	.92	11.33	456(a)	.....
July 12	"	63	423	.64	10.87	270(a)	.....
Sept. 18	"	63	152	1.78	10.97	270(a)	.....
Oct. 11	"	91	125	1.52	10.66	190	.....

(a) Measurement made at highway bridge.

(b) Ice measurement.

Monthly Discharge of Seguin River near Parry Sound for 1915-6

Drainage Area, 380 Square Miles

Month.	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	2,240	325	857	5.89	.86	2.26	2.52
December "	1,130	400	651	2.97	1.05	1.71	1.97
January (1916)	1,610	135	517	4.24	.36	1.36	1.57
February	2,470	285	1,005	6.50	.75	2.64	2.85
March.....	930	250	380	2.45	.66	1.00	1.15
April	4,000	1,010	2,370	10.53	2.66	6.24	6.96
May	4,650	1,010	2,198	12.24	2.66	5.78	6.66
June	1,180	400	677	3.11	1.05	1.78	1.99
July	361	186	272	.95	.49	.72	.83
August	208	144	177	.55	.38	.47	.54
September.....	325	170	272	.86	.45	.72	.80
October	1,090	156	375	2.87	.41	.99	1.14
The year.....	4,650	135	809	12.24	.36	2.13	28.99

South River near Powassan

Location—At highway bridge known as Healey's Bridge, about $2\frac{1}{2}$ miles north-west of the Town of Powassan, on lot 21, concession 13, Township of Himsworth, District of Parry Sound.

Records Available—Discharge measurements from March, 1912, to October, 1916. Daily gauge heights from March 11, 1914, to October 31, 1916.

Drainage Area—294 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, which was removed from old bridge and located on the north-west corner of the left abutment of the new Gough's highway bridge, about one mile below gauging station. Zero of gauge (elev. 23.00) is referred to bench mark (elev. 56.15) painted on a rock on the top corner of barn foundation known as Gough's barn, about 350 feet from gauge.

Channel—Straight for about 200 feet above and 1,500 feet below the gauging station. Both banks are high and not liable to overflow. The bed of the stream consists of clay and boulders, slightly shifting. The current is moderate.

Discharge Measurements—Made from Healey's highway bridge during high water, and, during low water periods, by wading 100 feet above bridge.

Control—About 5 miles below gauging station there is a dam used by the Nipissing Power Company plant. There is a two-foot fall 3 miles below section.

Winter Flow—During the winter months measurements are made through ice to determine the winter flow. The relation of gauge height to discharge is seriously affected by ice.

Accuracy—The rating curve is fairly well defined. Discharges for open water period are considered good. Measurements are made of flow of Genesee Creek entering between section and gauge.

Observer—Owen Gough, Powassan.

Remarks—The old Gough's Bridge was replaced in April, 1915, by a new bridge 150 feet upstream.

Discharge Measurements of South River near Powassan in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 29....	Murray, W. S....	111	421	1.17	25.80	493	.....
1916							
Jan. 15....	"	70	132	1.27	24.83	168 (a)	.....
Feb. 11....	"	74	201	1.65	26.02	333 (b)	.....
April 7....	"	120	1,052	1.48	31.08	1,567 (c)	.....
" 12....	"	125	809	1.60	28.91	1,295 (c)	.....
May 8....	"	115	702	1.42	28.33	998 (d)	.....
June 26....	"	110	385	.84	25.66	322	.....
Aug. 18....	"	56	89	.90	23.83	81	.....

(a) Measurement made on ice at wading section. Water on ice.

(b) Measurement made on ice at wading section.

(c) Ice broken up but not out of river.

(d) Logs in stream.

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Hgt.		Dis-charge	Gauge Hgt.		Dis-charge	Gauge Hgt.		Dis-charge	Gauge Hgt.		Dis-charge	Gauge Hgt.		Dis-charge	Gauge Hgt.		Dis-charge	Gauge Hgt.		Dis-charge	Gauge Hgt.		Dis-charge	Gauge Hgt.		Dis-charge	Gauge Hgt.		Dis-charge						
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.							
1	24.95	256	25.83	421	105	27.79	750	170	33.58	4050	28.87	1300	26.80	645	25.16	291	23.70	81	23.70	81	23.70	81	23.70	81	23.70	81	23.70	81	23.70	81	25.54	363				
2	24.70	216	25.70	395	24.29	117	27.54	695	178	33.95	4270	30.20	2020	26.58	590	24.95	256	23.66	76	24.41	172	24.41	172	24.41	172	24.41	172	24.41	172	24.41	172	25.21	300			
3	24.70	216	25.54	362	24.32	113	27.29	570	178	32.45	3370	29.74	1740	26.41	550	24.91	250	23.66	76	24.83	237	24.83	237	24.83	237	24.83	237	24.83	237	24.91	250					
4	24.66	210	25.41	337	24.16	105	26.79	525	178	31.87	3030	29.28	1490	26.29	520	24.91	250	23.70	81	24.70	216	24.70	216	24.70	216	24.70	216	24.70	216	24.79	230					
5	24.79	230	25.41	337	24.12	105	26.75	500	163	31.37	2720	28.91	1310	26.16	490	24.83	237	23.75	87	25.33	322	25.33	322	25.33	322	25.33	322	25.33	322	24.52	203					
6	24.95	256	25.37	329	24.37	123	26.58	479	24.91	163	31.00	2500	28.66	1210	26.04	466	24.70	216	23.66	76	25.87	475	25.87	475	25.87	475	25.87	475	24.50	185						
7	25.00	264	25.29	314	24.45	149	26.50	446	24.91	163	30.03	1920	28.50	1150	25.95	446	24.70	216	23.66	76	26.08	430	26.08	430	26.08	430	26.08	430	24.46	179						
8	24.87	243	25.29	314	24.54	156	26.33	415	24.83	163	29.74	1740	28.29	1080	25.83	421	24.66	210	23.70	81	25.41	337	25.41	337	25.41	337	25.41	337	24.41	172						
9	24.83	237	25.25	306	24.41	143	26.25	375	24.83	163	29.29	1500	27.95	965	25.91	438	24.66	210	23.87	101	25.16	237	25.16	237	25.16	237	25.16	237	24.33	161						
10	24.83	237	25.16	291	24.41	130	26.16	345	24.83	163	29.04	1370	27.66	880	25.95	446	24.58	197	23.91	106	24.83	237	24.83	237	24.83	237	24.83	237	24.33	161						
11	24.70	216	25.00	264	24.45	136	26.08	335	24.91	163	28.95	1330	27.83	930	26.00	457	24.54	191	24.00	117	24.66	210	24.66	210	24.66	210	24.66	210	24.29	155						
12	25.04	271	25.00	240	24.66	149	25.83	307	24.91	163	28.99	1350	27.83	930	25.78	411	24.50	185	24.20	143	24.37	166	24.37	166	24.37	166	24.37	166	24.25	150						
13	25.37	330	24.91	216	24.79	156	25.75	295	24.75	163	29.95	1870	27.29	775	25.16	291	24.45	178	24.04	122	24.29	155	24.29	155	24.29	155	24.29	155	25.03	269						
14	25.25	307	24.91	216	24.79	166	25.70	281	25.08	163	31.08	2550	27.20	750	25.12	284	24.04	122	23.91	106	24.20	143	24.20	143	24.20	143	24.20	143	25.25	307						
15	25.25	307	24.91	216	24.83	170	25.58	264	24.91	170	31.00	2500	27.16	740	25.24	285	23.91	106	23.83	97	24.16	138	24.16	138	24.16	138	24.16	138	25.33	322						
16	25.25	307	24.83	208	24.73	178	25.38	264	24.87	170	31.00	2500	27.49	830	25.87	430	23.87	101	23.83	97	24.04	122	24.04	122	24.04	122	24.04	122	25.58	371						
17	25.25	307	24.83	208	24.73	178	25.38	264	24.87	170	31.00	2500	27.49	830	25.87	430	23.87	101	23.83	97	24.04	122	24.04	122	24.04	122	24.04	122	25.58	371						
18	25.12	284	24.83	208	24.73	185	25.50	256	24.83	170	30.85	2470	27.74	900	26.00	457	24.08	127	23.79	92	24.00	117	24.00	117	24.00	117	24.00	117	26.00	457						
19	25.08	278	24.83	208	24.83	195	25.41	248	24.91	178	30.45	2170	27.95	965	26.12	483	24.08	127	23.75	91	24.04	122	24.04	122	24.04	122	24.04	122	25.91	438						
20	25.33	322	24.83	208	24.83	200	25.41	248	24.91	178	30.00	1900	28.33	1090	26.16	492	24.08	127	23.66	76	24.58	197	24.58	197	24.58	197	24.58	197	26.95	685						
21	25.58	371	24.75	193	24.83	216	25.33	232	24.87	188	29.70	1720	28.08	1010	26.04	466	24.00	117	23.66	76	24.83	237	24.83	237	24.83	237	24.83	237	27.75	905						
22	25.45	345	24.75	193	27.62	865	25.33	224	24.75	200	30.12	1970	27.70	890	26.00	457	24.04	122	23.66	76	24.62	203	24.62	203	24.62	203	24.62	203	28.41	1120						
23	25.37	329	24.75	193	28.08	1010	25.33	216	24.75	216	31.21	2630	27.54	840	26.00	457	24.00	117	23.66	76	24.54	191	24.54	191	24.54	191	24.54	191	28.08	1010						
24	25.33	322	24.75	193	27.58	855	25.25	200	24.83	237	31.03	2520	27.37	795	25.70	395	24.00	117	23.66	76	24.66	210	24.66	210	24.66	210	24.66	210	27.79	915						
25	25.29	314	24.75	193	27.41	805	25.08	185	24.83	237	30.49	2190	27.12	785	25.75	405	23.95	111	23.66	76	24.79	230	24.79	230	24.79	230	24.79	230	27.62	865						
26	25.25	306	24.75	193	27.58	855	25.08	185	24.95	256	30.08	1950	26.95	825	25.66	387	23.91	106	23.66	76	24.87	243	24.87	243	24.87	243	24.87	243	27.87	940						
27	25.37	329	24.75	193	27.33	785	25.08	185	25.33	322	29.58	1650	26.70	820	25.66	387	23.91	106	23.66	76	24.75	224	24.75	224	24.75	224	24.75	224	28.00	980						
28	25.62	379	24.75	193	28.00	845	25.08	185	27.33	785	29.04	1500	27.12	725	25.75	405	23.87	101	23.66	76	24.79	230	24.79	230	24.79	230	24.79	230	27.96	970						
29	25.79	413	24.66	193	28.25	920	25.08	185	28.43	1130	29.04	1370	27.33	785	25.62	379	23.83	97	23.63	73	25.41	337	25.41	337	25.41	337	27.71	895								
30	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91	438	24.54	136	28.08	905	25.08	185	30.58	2250	28.74	1250	27.16	740	25.45	345	23.83	97	23.62	71	25.79	413	25.79	413	25.79	413	25.79	413	27.33	785						
31	25.91																																			

Monthly Discharge of South River near Powassan for 1915-6

Drainage Area, 294 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November .(1915)	438	150	293	1.49	.51	1.00	1.12
December "	421	105	246	1.43	.36	.84	.97
January ..(1916)	1,010	105	382	3.43	.36	1.30	1.50
February	750	185	335	2.55	.63	1.14	1.23
March	3,690	163	415	12.55	.55	1.41	1.63
April.....	4,270	1,250	2,183	14.52	4.25	7.43	8.29
May	2,020	620	983	6.87	2.11	3.34	3.85
June.....	645	284	434	2.19	.97	1.48	1.65
July.....	291	93	161	.99	.32	.55	.63
August	155	71	89	.53	.24	.30	.35
September	475	81	229	1.62	.28	.78	.87
October.....	1,120	150	506	3.81	.51	1.72	1.98
The year.....	4,270	71	519	14.52	.24	1.77	24.09

Spanish River at Espanola

Location—At highway bridge, about 200 yards below Espanola Falls and about the same distance below the Spanish River Pulp and Paper Mills, in the Town of Espanola, Township of Merritt, Sudbury District.

Records Available—Discharge measurements from March, 1914, to October, 1916. Daily gauge heights from May 6, 1915, to October 31, 1916.

Drainage Area—4,490 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, fastened to pile near left abutment on upstream side of bridge. Zero of gauge (elev. 19.00 feet) is referred to bench mark (elev. 25.38 feet) located on top of nose of left abutment.

Channel—Above the station the water from the Falls and Power House flows into a pool about 700 feet wide and then narrows down to 225 feet at the bridge, thence flowing straight for about 1,000 feet. Both banks are high, rocky, wooded, and will not overflow. The bed of the stream is composed of clay and boulders, practically permanent. The current is fast, one channel existing at low stages. At high stages the stream flows through two channels, separated by the centre pier of the bridge.

Discharge Measurements—Made from highway bridge with a Price current meter. Occasional check measurements are made at Webbwood bridge.

Regulation—The paper plant uses all the water coming down the river at low stages during the summer, discharging through the tail race and past the section. The river is used throughout the spring and summer for log driving.

Winter Flow—Ice forms about one mile below the station, but remains open at the gauging section during the entire year.

Accuracy—Conditions at station are not very favorable for making accurate discharge measurements. The discharge relation is affected by logs during the log driving period. As there are not sufficient records available to compute discharges for that period, the open water rating curve was assumed applicable.

Observer—Thos. Lynch, Espanola.

Discharge Measurements of Spanish River at Espanola in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 17....	Murray, W. S..	228	3,116	1.69	23.56	5,279	.....
Dec. 7....	"	228	3,493	2.21	25.25	2,710	.....
1916							
Jan. 12....	"	220	2,960	1.18	22.91	3,484 (a)	.....
Feb. 9....	"	217	2,619	.93	21.58	2,424 (b)	.....
Mar. 9....	"	214	2,831	1.09	22.41	3,087 (c)	.....
Apr. 25....	"	228	7,233	4.08	37.84	29,503	.....
May 30....	"	228	3,840	2.66	26.75	10,231 (d)	.....
June 7....	"	234	3,543	1.77	24.16	6,270 (e)	.....
Aug. 24....	"	198	2,681	1.07	22.00	2,851	.....
" 24....	"	212	3,205	.80	22.00	2,575 (e)	.....
Oct. 18....	"	246	2,599	1.06	21.37	2,750	.....
" 18....	"	193	3,026	.85	21.35	2,504 (e)	.....

(a) Ice on river 300 ft. below section.

(b) Side and back current at centre pier. Ice on part of section.

(c) Ice on part of section.

(d) Logs on control.

(e) Reading taken at Webbwood.

Daily Gauge Height and Discharge of Spanish River at Espanola for 1915-6

Drainage Area 4,490 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.	
1	23.29	4580		25.16	7560		23.16	4390		22.33	3280		22.50	3500		27.95	12220		34.83	24090		26.28	9380		25.98	8870		21.75	2550		21.85	2670		21.08	1750	
2	22.66	3710		25.12	7490		23.08	4270		22.31	3250		22.41	3380		29.75	15280		34.00	22600		25.90	8740		26.08	9040		21.71	2500		21.83	2650		21.50	2250	
3	22.50	3500		25.16	7560		23.25	4520		22.25	3180		22.35	3300		30.83	17110		33.83	22290		25.83	8630		25.66	8360		22.00	2850		21.79	2600		21.46	2200	
4	22.27	3200		25.33	7830		22.83	3930		22.10	3100		22.15	3180		30.62	16750		33.30	20390		25.17	7360		25.38	7910		22.08	2950		21.79	2600		21.41	2140	
5	22.46	3450		25.08	7430		22.00	4150		22.18	3080		22.12	1790		31.08	17540		33.00	20800		24.71	6360		24.87	7090		22.08	2950		21.83	2650		21.45	2190	
6	22.39	3360		25.47	8050		23.25	4060		21.75	2550		22.58	3600		31.25	17820		32.75	20370		23.83	5430		24.58	6630		21.91	2740		21.83	2650		21.50	2250	
7	22.25	3180		25.41	7960		23.08	3960		21.66	2440		22.34	3390		31.33	17960		32.50	19950		24.39	6500		23.91	5560		22.15	3040		21.91	2740		21.57	2090	
8	22.80	3890		25.39	7920		23.08	3960		21.62	2390		22.54	3550		31.33	17960		32.50	19950		24.39	6500		23.91	5560		22.15	3040		21.91	2740		21.03	1690	
9	23.31	4620		24.73	8870		22.91	3760		21.60	2370		22.29	3230		31.16	17670		32.00	19100		24.50	6500		23.58	5030		22.04	2900		21.95	2790		20.87	1510	
10	23.27	4560		24.54	8560		22.91	3700		21.56	2320		22.12	3010		33.33	21390		31.50	18250		24.54	6560		23.58	5030		22.04	2900		21.95	2790		20.87	1510	
11	23.35	4680		24.42	8370		22.83	3560		21.45	2190		21.98	2830		29.83	15410		31.20	17740		24.35	6260		23.75	5300		22.06	2930		22.08	2950		21.41	2140	
12	23.35	4680		24.68	8790		22.91	3500		21.33	2050		20.10	755		29.74	15260		30.95	17320		25.62	8290		23.70	5220		22.08	2950		21.91	2740		21.41	2140	
13	24.00	5700		24.54	8390		22.75	3340		21.35	2070		21.87	2690		29.45	14760		30.75	16380		25.29	7760		23.52	4930		22.00	2850		21.83	2650		21.16	1840	
14	23.47	4860		24.43	8390		22.75	3340		21.35	2070		21.87	2690		29.45	14760		30.75	16380		25.29	7760		23.52	4930		22.00	2850		21.83	2650		21.16	1840	
15	23.54	4960		24.54	8560		22.66	3300		21.33	2050		22.00	2850		31.66	18520		30.00	15700		25.16	7560		23.22	4480		22.06	2930		22.25	3180		21.66	2440	
16	23.56	5000		24.45	8420		22.64	3270		21.27	1970		22.04	3060		31.16	17670		30.00	15700		25.16	7560		23.08	4270		22.06	2930		22.25	3180		21.66	2440	
17	23.54	4960		24.31	8200		22.62	3240		21.25	1950		22.04	3060		32.00	19100		29.60	15020		25.45	8020		22.83	3930		22.04	2900		22.05	3180		21.74	2540	
18	23.43	4800		24.12	8890		22.54	3210		21.25	1950		21.87	2690		33.50	21700		29.00	14000		26.40	9580		22.54	3550		21.95	2790		21.62	2390		21.16	1840	
19	23.23	4580		23.83	5430		22.58	3180		21.18	1870		20.25	885		33.75	22150		28.00	15700		27.12	10800		22.37	3330		21.91	2740		21.58	2350		21.00	1650	
20	23.83	5430		23.00	5700		22.56	3180		20.54	1170		21.79	2790		33.00	21700		29.00	14000		26.40	9580		22.37	3330		21.91	2740		21.58	2350		21.00	1650	
21	23.41	4760		23.91	5560		22.33	3280		21.75	2550		21.91	2740		34.00	22600		28.00	12300		28.00	12300		22.04	2900		21.91	2740		21.66	2440		21.96	2800	
22	24.00	5700		23.83	5430		22.89	4010		21.81	2620		21.95	2790		34.16	22890		27.75	11480		27.79	11940		21.91	2740		21.87	2690		21.41	2140		21.33	2050	
23	23.66	5160		23.81	5400		22.89	4010		21.81	2620		21.95	2790		34.16	22890		27.75	11480		27.79	11940		21.91	2740		21.87	2690		21.41	2140		21.33	2050	
24	23.21	4460		23.54	4960		23.41	4760		22.29	3230		22.04	2900		34.58	23640		26.83	10310		27.54	11520		22.00	2850		22.00	2850		21.41	2140		21.83	2650	
25	23.35	4680		22.75	3820		23.29	4590		22.22	3140		22.00	2850		34.33	23190		27.50	11450		27.74	11860		22.00	2850		22.00	2850		21.41	2140		21.33	3280	
26	23.45	4820		23.08	4270		23.16	4390		22.22	3140		21.91	3390		35.75	23950		25.75	8500		27.60	9920		22.00	2850		21.87	2690		21.50	2250		23.91	5560	
27	23.75	5300		23.08	4270		23.16	4390		22.08	2950		22.33	3280		35.66	25590		25.00	7300		26.74	10160		22.08	2950		21.83	2650		21.46	2200		24.00	5700	
28	23.91	5560		23.12	4390		23.12	4390		22.50	3500		23.72	5250		35.16	24690		26.50	10020		26.58	9890		22.29	3230		21.83	2650		21.41	2140		23.91	5560	
29	25.50	8100		23.16	4390		22.95	4080		22.58	3600		22.95	4080		35.00	24400		26.66	10020		26.29	9320		22.45	3440		21.89	2720		21.41	2140		24.81	7160	
30	25.16	7560		23.16	4390		22.90	4020		22.90	3600		23.62	5090		35.50	25300		26.66	10020		26.25	9320		22.45	3440		21.89	2720		21.41	2140		24.81	7160	
31	.....	.....		23.21	4460		22.90	4020		22.90	3600		23.62	5090		35.50	25300		26.66	10020		26.25	9320		22.45	3440		21.89	2720		21.41	2140		24.81	7160	

Monthly Discharge of Spanish River at Espanola for 1915-6

Drainage Area, 4,490 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	8,100	3,180	4,793	1.80	.71	1.07	1.19
December	8,050	3,820	6,091	1.79	.85	1.36	1.57
January... (1916)	1,760	3,180	3,860	1.06	.71	.86	.99
February	3,600	1,170	2,566	.80	.26	.57	.61
March	7,890	755	3,116	1.76	.17	.69	.80
April	25,590	12,220	19,854	5.70	2.72	4.42	4.93
May	24,090	7,300	15,227	5.37	1.63	3.39	3.91
June	13,000	5,430	8,846	2.90	1.21	1.97	2.20
July	9,040	2,740	4,675	2.01	.61	1.04	1.20
August	3,040	2,500	2,803	.68	.56	.62	.71
September	3,180	885	2,498	.71	.20	.56	.62
October	7,160	1,510	3,058	1.59	.33	.68	.78
The year	25,590	885	6,442	5.70	.20	1.43	19.46

Sturgeon River at Smoky Falls

Location—At the highway bridge at Smoky Falls Post Office, and two miles above the Smoky Falls, Township of Springer, Nipissing District.

Records Available—Discharge measurements, August, 1912, to October, 1916. Daily gauge heights, January 12 to 31, 1914, and March 15, 1914, to October 31, 1916.

Drainage Area—2,250 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, and attached to a wooden pile on the right, upstream side of the bridge. The zero on the gauge (elevation 32.00) is referred to a bench mark (elevation 53.47) painted on a rock on the right bank of the river, about 175 feet above the bridge.

Channel—Straight for about 700 feet above and about 1 mile below the station. The banks are fairly high, clean, sandy and not liable to overflow. The bed of the stream is composed of clay and sand, slightly shifting. The current is fast and smooth, flowing through six channels, formed by bridge piers and abutments.

Discharge Measurements—Made from highway bridge with a Price current meter.

Regulation—Dams above are used for power and log driving purposes.

Winter Flow—During the winter months the river is covered with ice, and measurements are made through the ice to determine the winter discharge. The relation of gauge height to discharge is seriously affected by ice.

Accuracy—The open water rating curve is fairly well defined. The relation of gauge height to discharge is affected during the log-driving season.

Observer—A. Pineault, Smoky Falls.

Discharge Measurements of Sturgeon River at Smoky Falls in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Dec. 1....	Murray, W. S ..	210	2,293	1.84	35.58	4,208	.....
1916							
Jan. 27....	" ..	210	1,663	1.10	33.74	1,843 (a)	.....
Feb. 25....	" ..	205	1,622	1.18	33.91	1,913 (a)	.....
Mar. 24....	" ..	205	1,538	1.29	34.08	1,979 (a)	.....
May 5....	" ..	210	3,410	4.70	40.91	16,027	.....

(a) Ice measurement.

Monthly Discharge of Sturgeon River at Smoky Falls for 1915-6

Drainage Area 2,250 Square Miles

Month	Discharge in Second-feet.			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area.
November (1915)	4,170	1,480	2,096	1.85	.66	.93	1.04
December “	4,380	1,860	2,815	1.95	.83	1.25	1.44
January .. (1916)	1,970	1,480	1,687	.88	.66	.75	.86
February	2,185	1,815	1,953	.97	.81	.87	.94
March.....	4,105	1,990	2,243	1.82	.88	1.00	1.15
April.....	15,620	5,255	9,153	6.94	2.34	4.07	4.54
May.....	15,930	6,170	10,224	7.08	2.74	4.54	5.23
June	6,170	2,670	4,528	2.74	1.19	2.01	2.24
July.....	3,460	1,480	2,355	1.54	.66	1.05	1.21
August	2,140	1,180	1,577	.95	.48	.70	.81
September	1,310	870	1,042	.58	.39	.46	.51
October.....	3,220	975	1,812	1.43	.43	.81	.93
The year	15,930	870	3,450	7.08	.39	1.53	20.83

Vermilion River near Whitefish

Location—At the old highway bridge 50 feet above the rapids, 300 feet north of C.P.R. bridge, and two miles east of the Town of Whitefish, Township of Graham, Sudbury District.

Records Available—Discharge measurements from August, 1913, to October, 1916. Daily gauge heights from June 11, 1915, to October 31, 1916.

Drainage Area—1,580 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, attached to pile at the left abutment of old highway bridge. Zero of gauge (elev. 25.00 feet) is referred to bench mark (elev. 38.39) painted on rock on right bank 15 feet above gauging station.

Channel and Control—Straight for about 300 feet above and 700 feet below the station. Both banks are high, rocky and wooded, and not liable to overflow. Bed of stream is rocky and permanent, current is swift, two channels existing at all stages on account of the centre pier of the bridge. Log jams sometimes occur on the rapids during low flows, causing back water at the station.

Discharge Measurements—Made from old highway bridge with a Price current meter.

Winter Flow—On account of the fast current the channel at gauging station remains open during the winter months, ice forming at banks, allowance for this being made in estimates.

Accuracy—Rating curve fairly well defined between gauge heights 27.00 feet and 32.00 feet. As there are not sufficient data available for computing the discharge during the log driving period the open water curve was assumed applicable.

Observer—A. Boucher, Whitefish.

Discharge Measurements of Vermilion River near Whitefish in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 22	Murray, W. S..	169	853	1.97	28.35	1,685	.....
Dec. 4	" ..	184	1,069	2.73	29.58	2,626(a)	.....
1916							
Jan. 28	" ..	144	735	1.52	27.74	1,116(b)	.....
Feb. 5	" ..	104	730	1.38	27.76	1,008(c)	.....
Mar. 7	" ..	135	594	1.32	27.33	784(d)	.....
April 13	" ..	196	1,397	4.40	31.26	6,139	.....
May 9	" ..	206	1,465	5.13	31.57	7,511	.....
June 8	" ..	188	928	2.37	28.82	2,207	.....

- (a) Floating ice at section.
- (b) Section partly ice-covered.
- (c) Section partly ice-covered and at gauge.
- (d) Ice measurement.

Daily Gauge Height and Discharge of Vermilion River near Whitefish for 1915-6

Drainage Area 1,580 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge			
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.	Feet
1	28.16	1420	28.99	2380	27.99	1250	27.74	1025	805	27.83	1105	33.95	13120	28.78	2130	29.08	2500	27.25	635	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152			
2	28.08	1340	29.83	3580	27.91	1180	27.74	1025	745	29.66	3320	33.61	12240	28.70	2030	29.00	2390	27.28	635	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152			
3	28.16	1420	29.74	3440	27.91	1180	27.74	1025	745	30.33	3465	33.45	11820	28.43	1710	28.91	2280	26.33	186	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152			
4	28.24	1500	29.58	3200	27.91	1180	27.74	1025	745	31.16	6100	33.32	11480	28.45	1740	28.91	2280	26.75	335	26.33	186	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152			
5	28.25	1510	28.99	2380	27.91	1180	27.74	1025	745	31.33	6480	33.15	11040	28.45	1740	28.91	2280	26.50	220	26.50	220	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152			
6	28.25	1510	28.83	2185	27.83	1105	27.74	1025	745	31.49	6845	32.95	10520	28.28	1550	28.91	2280	26.50	220	26.50	220	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152			
7	28.29	1550	28.83	2185	27.83	1105	27.74	1025	745	31.49	6845	31.53	6940	28.20	1460	28.91	2280	26.50	220	26.50	220	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152	26.16	152			
8	28.24	1500	28.74	2080	27.74	1025	27.74	1025	745	31.49	6845	31.28	6370	29.08	2500	29.08	2500	26.50	220	26.50	220	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170			
9	28.24	1500	28.66	1980	27.74	1025	27.74	1025	745	31.41	6665	31.03	5820	29.08	2500	29.08	2500	26.50	220	26.58	252	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170			
10	28.24	1500	28.66	1980	27.74	1025	27.74	1025	745	31.33	6480	30.95	5650	29.00	2390	29.00	2390	26.41	202	26.58	252	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170			
11	28.24	1500	28.49	1780	27.74	1025	27.66	955	745	31.24	6280	30.78	5320	29.83	3580	29.00	2390	26.50	220	26.58	252	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170			
12	28.24	1500	28.41	1690	27.74	1025	27.66	955	745	31.33	6480	30.70	5170	29.75	3450	28.91	2280	26.75	335	26.50	220	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170			
13	28.33	1605	28.41	1690	27.74	1025	27.66	955	745	31.49	6845	30.45	4700	29.66	3320	28.83	2190	26.66	296	26.58	252	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170			
14	28.33	1605	28.53	1605	27.74	1025	27.66	955	745	31.74	7425	30.28	4370	29.66	3320	28.66	1980	26.66	296	26.50	220	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170	26.25	170			
15	28.33	1605	28.33	1605	27.74	1025	27.66	955	745	31.83	7640	30.20	4220	29.66	3320	28.58	1890	26.58	252	26.50	220	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186			
16	28.33	1605	28.33	1605	27.74	1025	27.66	955	745	31.91	7835	29.95	3780	29.66	3320	28.50	1790	26.58	252	26.50	220	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186			
17	28.33	1605	28.24	1500	27.74	1025	27.66	955	745	31.91	7835	29.86	3630	29.75	3450	28.50	1790	26.50	220	26.16	152	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186			
18	28.33	1605	28.24	1500	27.74	1025	27.66	955	745	31.91	7835	29.78	3500	29.83	3580	28.50	1790	26.50	220	26.16	152	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186			
19	28.33	1605	28.16	1420	27.74	1025	27.66	955	745	31.91	7835	29.70	3380	29.91	3710	28.41	1690	26.33	186	26.16	152	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186			
20	28.33	1605	28.16	1420	27.74	1025	27.66	955	745	31.99	8025	29.53	3130	29.91	3710	28.41	1690	26.33	186	26.16	152	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186			
21	28.33	1605	28.16	1420	27.74	1025	27.66	955	745	32.66	9765	30.36	4520	29.91	3710	28.16	1420	26.33	186	26.16	152	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186			
22	28.33	1605	28.16	1420	27.83	1105	27.58	880	745	32.66	9765	30.36	4520	29.91	3710	28.16	1420	26.33	186	26.16	152	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186	26.33	186			
23	28.33	1605	28.16	1420	27.83	1105	27.58	880	745	34.49	14525	29.28	2780	29.83	3580	28.00	1260	26.25	170	26.00	120	27.08	316	27.08	316	27.08	316	27.08	316	27.08	316	27.08	316			
24	28.24	1500	28.16	1420	27.83	1105	27.49	805	745	34.74	15175	29.28	2780	29.75	3450	28.00	1260	26.25	170	26.00	120	27.25	635	27.25	635	27.25	635	27.25	635	27.25	635	27.25	635			
25	28.24	1500	28.08	1340	27.83	1105	27.49	805	745	34.74	15175	29.28	2780	29.75	3450	28.00	1260	26.25	170	26.00	120	27.25	635	27.25	635	27.25	635	27.25	635	27.25	635	27.25	635			
26	28.33	1605	28.08	1340	27.83	1105	27.49	805	745	34.56	14185	29.20	2670	29.66	3320	27.83	1110	26.25	170	26.00	120	27.33	690	27.33	690	27.33	690	27.33	690	27.33	690	27.33	690			
27	28.33	1605	28.08	1340	27.83	1105	27.49	805	745	34.16	13665	29.03	2430	29.50	3090	27.75	1030	26.25	170	26.08	136	27.66	955	27.66	955	27.66	955	27.66	955	27.66	955	27.66	955			
28	28.49	1780	28.08	1340	27.74	1025	27.49	805	745	33.49	11925	28.95	2330	29.35	2850	27.91	1180	26.25	170	26.16	152	27.66	955	27.66	955	27.66	955	27.66	955	27.66	955	27.66	955			
29	28.74	2080	28.08	1340	27.74	1025	27.49	805	745	33.09	10885	28.86	2220	29.16	2610	27.75	1030	26.25	170	26.16	152	27.75	1030	27.75	1030	27.75	1030	27.75	1030	27.75	1030	27.75	1030			
30	28.83	2185	28.08	1340	27.74	1025	27.49	805	745	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
31	.....	.....	27.99	1250	27.74	1025	27.49	805	745	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Monthly Discharge of Vermilion River near Whitefish for 1915-6

Drainage Area, 1,580 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum.	Mean.	Depth in Inches on Drainage Area
November (1915)	2,185	1,340	1,585	1.38	.85	1.00	1.12
December	3,580	1,250	1,821	2.27	.79	1.15	1.33
January (1916)	1,250	1,025	1,073	.79	.65	.68	.78
February	1,025	805	943	.65	.51	.60	.65
March	1,025	515	696	.65	.33	.44	.51
April	15,175	1,105	9,024	9.60	.70	5.71	6.37
May	13,120	2,220	5,442	8.30	1.41	3.44	3.97
June	3,710	1,460	2,915	2.35	.92	1.84	2.05
July	2,500	745	1,836	1.58	.47	1.16	1.34
August	635	170	241	.40	.11	.15	.17
September	252	102	177	.16	.06	.11	.12
October	1,030	136	341	.65	.09	.22	.25
The year	15,175	102	2,168	9.60	.06	1.37	18.65

Wanapitei River at McVittie's

Location—Along the C. N. Ry, line, twenty miles south of the Town of Sudbury, and about two miles up stream from McVittie's power house, and 300 feet above Water Falls, southeast corner of the Township of Secord, District of Sudbury (Mining Division).

Records Available—Discharge measurements from September, 1916, to October, 1916. Daily gauge heights from October 1, 1916, to October 31, 1916.

Drainage Area—1,175 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, fastened on a 2 x 4 scantling and secured to a large tree on right shore on the cross section line. The zero of the gauge (elev. 5.00 ft.) is referred to a bench mark (elev. 11.15 feet) on top of spike riven in stump, 6½ feet downstream from initial point, right shore.

Channel—Straight for about 400 feet above and 300 feet below the station. Banks are high, rocky, and wooded, and not liable to overflow. The bed of the stream is composed of clay, practically permanent; the current is slow.

Discharge Measurements—Made from boat with a small Price current meter.

Control—During log driving periods logs may jam at the head of the falls, which is 300 feet below station. The jam may cause a back water affect at the gauging station.

Observer—J. S. McVittie, McVittie's Siding.

Discharge Measurements of Wanapitei River at McVittie's

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916							
Sept. 8....	Murray, W. S....	142	2,195	.35	102.08	770	.....
" 28....	" ..	142	2,190	.32	101.83	704	.....

Wanapitei River near Wanapitei

Location—100 feet above the falls known as Timmins Chute, six miles above the Village of Wanapitei, Township of Dryden, Sudbury District.

Records Available—Monthly discharge measurements from June, 1914 to August, 1916. Daily gauge heights from August 15, 1915, to October 31, 1916.

Drainage Area—940 square miles.

Gauge—Vertical steel staff with enamelled face, graduated in feet and inches, and fastened on a 2 x 8 scantling to a large elm tree on left bank 150 feet above falls. Zero of gauge (elev. 24.00 feet) is referred to bench mark (elev. 30.00 feet) painted on top of prominent rock at brink of falls on right shore.

Channel—Straight for about 500 feet above and 100 feet below gauging station. Banks are high, rocky and wooded, and do not overflow. The bed of the stream is composed of clay and gravel, slightly shifting. The current is moderate.

Discharge Measurements—Made by boat with Price current meter. Affected by construction work August-September.

Winter Flow—River is covered with ice during the winter months, and measurements are made through ice to determine the winter discharge.

Observer—Wilfred Rioux, Wanapitei.

Discharge Measurements of Wanapitei River near Wanapitei in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 23	Murray, W. S..	108	642	1.03	25.81	667	.....
1916							
Jan. 13	" ..	111	562	1.25	25.75	702(a)	.....
Feb. 3	" ..	104	532	1.39	25.66	738(a)	.....
Apr. 26	" ..	143	2,207	1.68	28.75	3,704(b)	.....
May 31	" ..	145	1,262	3.15	30.64	3,978	.....
Aug. 25	" ..	112	641	1.39	25.50	894(c)	.....

- (a) Ice measurement.
- (b) Measurement taken at C. P. R. bridge at Wanapitei.
- (c) Control changed by construction of power plant three-quarter mile above section.

Daily Gauge Height and Discharge of Wanapitei River near Wanapitei for 1915-6

Drainage Area, 940 Square Miles

Date	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet			
1	25.79	700	26.12	835	25.79	700	25.75	665	25.62	635	25.42	555	31.08	4360	28.66	2280	28.60	2240	27.41	1470	25.31	520	25.31	520	27.33	1420	25.31	520	27.33	1420	25.31	520	27.33	1420	25.31	520
2	25.79	700	26.08	815	25.79	700	25.66	650	25.66	650	25.50	585	31.41	4690	28.16	1930	28.71	2320	27.33	1420	25.31	520	25.31	520	27.33	1420	25.31	520	27.33	1420	25.31	520	27.33	1420	25.31	520
3	25.75	685	26.00	785	25.83	715	25.66	650	25.66	650	25.62	635	31.50	4780	27.91	1770	28.91	2460	27.29	1390	25.25	498	25.25	498	27.29	1390	25.25	498	27.29	1390	25.25	498	27.29	1390	25.25	498
4	25.79	700	26.00	785	25.79	700	25.70	665	25.81	710	25.66	650	31.58	4860	28.25	1990	28.93	2470	27.25	1370	25.33	525	25.33	525	27.25	1370	25.33	525	27.25	1370	25.33	525	27.25	1370	25.33	525
5	25.79	700	25.95	765	26.00	785	25.75	685	25.79	700	25.79	700	31.66	4940	28.50	2170	28.93	2470	27.16	1320	25.35	535	25.35	535	27.16	1320	25.35	535	27.16	1320	25.35	535	27.16	1320	25.35	535
6	25.79	700	25.95	765	25.91	750	25.75	685	25.75	685	25.79	700	31.66	4940	28.50	2170	28.93	2470	27.16	1320	25.33	525	25.33	525	27.16	1320	25.33	525	27.16	1320	25.33	525	27.16	1320	25.33	525
7	25.79	700	25.95	765	25.83	715	25.75	685	25.75	685	25.79	700	31.66	4940	28.50	2170	28.93	2470	27.16	1320	25.33	525	25.33	525	27.16	1320	25.33	525	27.16	1320	25.33	525	27.16	1320	25.33	525
8	25.79	700	25.95	765	25.83	715	25.70	665	25.75	685	25.83	715	31.62	4900	27.96	1800	27.83	1720	27.09	1390	25.27	505	25.27	505	27.09	1390	25.27	505	27.09	1390	25.27	505	27.09	1390	25.27	505
9	25.83	715	25.75	685	25.83	715	25.75	685	25.79	700	25.83	715	31.54	4820	27.91	1770	27.81	1710	27.21	1350	25.27	505	25.27	505	27.21	1350	25.27	505	27.21	1350	25.27	505	27.21	1350	25.27	505
10	25.83	715	25.58	615	25.79	700	25.75	685	25.79	700	25.91	770	31.41	4690	27.91	1770	27.75	1670	27.00	1270	25.16	466	25.16	466	27.00	1270	25.16	466	27.00	1270	25.16	466	27.00	1270	25.16	466
11	25.79	700	25.45	565	25.83	715	25.71	670	25.75	685	26.04	780	31.41	4690	27.75	1670	27.75	1670	27.00	1270	25.16	466	25.16	466	27.00	1270	25.16	466	27.00	1270	25.16	466	27.00	1270	25.16	466
12	25.79	700	25.54	600	25.83	715	25.66	650	25.75	685	26.12	835	31.29	4570	27.54	1540	27.66	1620	26.68	1080	25.16	466	25.16	466	26.68	1080	25.16	466	26.68	1080	25.16	466	26.68	1080	25.16	466
13	25.87	735	25.70	665	25.75	685	25.66	650	25.71	670	26.21	870	31.12	4400	27.12	1290	27.64	1600	26.58	1030	25.16	466	25.16	466	26.58	1030	25.16	466	26.58	1030	25.16	466	26.58	1030	25.16	466
14	25.83	715	25.75	685	25.75	685	25.66	650	25.71	670	26.25	885	31.62	4900	27.79	1690	27.58	1570	26.54	1010	25.12	452	25.12	452	26.54	1010	25.12	452	26.54	1010	25.12	452	26.54	1010	25.12	452
15	25.79	700	25.83	715	25.75	685	25.66	650	25.66	650	26.41	955	31.00	4280	27.52	1530	27.58	1570	26.54	1010	25.12	452	25.12	452	26.54	1010	25.12	452	26.54	1010	25.12	452	26.54	1010	25.12	452
16	25.79	700	25.79	700	25.83	715	25.64	640	25.66	650	26.41	955	31.00	4280	27.52	1530	27.58	1570	26.54	1010	25.12	452	25.12	452	26.54	1010	25.12	452	26.54	1010	25.12	452	26.54	1010	25.12	452
17	25.79	700	25.79	700	25.83	715	25.66	650	25.71	670	26.21	870	31.12	4400	27.12	1290	27.64	1600	26.58	1030	25.16	466	25.16	466	26.58	1030	25.16	466	26.58	1030	25.16	466	26.58	1030	25.16	466
18	25.79	700	25.75	685	25.87	735	25.66	650	25.71	670	26.41	955	30.83	4110	28.00	1820	27.58	1570	26.50	970	25.08	438	25.08	438	26.50	970	25.08	438	26.50	970	25.08	438	26.50	970	25.08	438
19	25.83	715	25.75	685	25.91	750	25.73	675	25.66	650	26.25	885	30.83	4110	28.08	1880	27.58	1570	26.41	955	25.08	438	25.08	438	26.41	955	25.08	438	26.41	955	25.08	438	26.41	955	25.08	438
20	25.83	715	25.75	685	25.91	750	25.70	665	25.79	700	26.20	895	31.66	4940	28.08	1880	27.58	1570	26.39	945	25.04	424	25.04	424	26.39	945	25.04	424	26.39	945	25.04	424	26.39	945	25.04	424
21	25.83	715	25.75	685	25.91	750	25.66	650	25.66	650	26.41	955	31.54	4820	27.98	1810	27.75	1670	26.37	935	25.08	438	25.08	438	26.37	935	25.08	438	26.37	935	25.08	438	26.37	935	25.08	438
22	25.81	710	25.79	700	25.96	770	25.58	615	25.58	615	26.66	1060	31.39	4670	27.85	1730	28.16	1930	26.35	925	25.08	438	25.08	438	26.35	925	25.08	438	26.35	925	25.08	438	26.35	925	25.08	438
23	25.81	710	25.79	700	25.96	770	25.58	615	25.66	650	26.66	1060	31.27	4550	28.81	2390	27.83	1720	25.00	410	25.08	438	25.08	438	25.00	410	25.08	438	25.00	410	25.08	438	25.00	410	25.08	438
24	25.83	715	25.83	715	25.79	700	25.58	615	25.58	615	27.00	1220	31.23	4510	28.77	2360	27.79	1690	24.91	383	25.18	473	25.18	473	24.91	383	25.18	473	24.91	383	25.18	473	24.91	383	25.18	473
25	25.83	715	25.83	715	25.75	685	25.50	585	25.50	585	28.50	2170	31.16	4440	29.16	2650	27.73	1660	25.50	585	25.33	525	25.33	525	25.50	585	25.33	525	25.50	585	25.33	525	25.50	585	25.33	525
26	25.83	715	25.83	715	25.75	685	25.50	585	25.58	615	28.75	2340	31.12	4400	29.16	2650	27.73	1660	25.46	570	25.23	490	25.23	490	25.46	570	25.23	490	25.46	570	25.23	490	25.46	570	25.23	490
27	26.16	850	25.79	700	25.58	615	25.50	585	25.58	615	29.66	3050	31.66	4940	28.83	2400	27.58	1570	25.41	555	25.25	498	25.25	498	25.41	555	25.25	498	25.41	555	25.25	498	25.41	555	25.25	498
28	26.25	885	25.79	700	25.62	635	25.50	585	25.54	600	30.29	3620	31.58	4860	28.66	2280	27.58	1570	25.41	555	25.25	498	25.25	498	25.41	555	25.25	498	25.41	555	25.25	498	25.41	555	25.25	498
29	26.25	885	25.83	715	25.73	675	25.58	615	25.50	585	30.70	3990	31.47	4750	28.60	2240	27.50	1520	25.37	540	25.21	484	25.21	484	25.37	540	25.21	484	25.37	540	25.21	484	25.37	540	25.21	484
30	26.22	875	25.83	715	25.75	685	25.58	615	25.58	615	25.42	555	30.83	4110	28.60	2240	27.50	1520	25.33	525	25.21	484	25.21	484	25.33	525	25.21	484	25.33	525	25.21	484	25.33	525	25.21	484
31	.....	.....	25.79	700	25.75	685	25.75	685	25.75	685	25.41	555	30.58	3880	27.50	1520	27.50	1520	25.31	520	25.31	520	25.31	520	27.33	1420	25.31	520	27.33	1420	25.31	520	27.33	1420	25.31	520

Monthly Discharge of Wanapitei River near Wanapitei for 1915-6

Drainage Area, 940 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1415)	885	685	729	.94	.73	.78	.87
December ..	835	565	710	.89	.60	.76	.88
January .. (1916)	785	615	706	.84	.65	.75	.86
February	685	525	643	.73	.56	.68	.73
March	710	555	649	.76	.59	.69	.80
April	4,110	555	1,311	4.37	.59	1.39	1.55
May	4,940	3,880	4,609	5.26	4.13	4.90	5.64
June	2,650	1,290	1,985	2.82	1.37	2.08	2.32
July	2,470	1,520	1,787	2.63	1.62	1.90	2.19
August	1,470	383	979	1.56	.41	1.04	1.20
September	535	424	478	.57	.45	.51	.57
October .....	.....	.....	.....	.....	.....	.....	.....
The year	4,940	383	1,330	5.26	.41	1.41	17.58

Regular Stations

NORTH-WESTERN ONTARIO DISTRICT

River	Location	Drain- age Area Sq. Miles	Township	District
Eagle	at Eagle River.....	970	.....	Kenora
English.....	at Caribou Falls.....	21,600	.....	" .....
"	at Ear Falls	11,700	.....	" .....
"	at Manitou Falls.....	14,600	.....	" .....
"	near Oak Falls.....	15,570	.....	" .....
"	at Sturgeon Falls.....	.....	.....	" .....
Footprint	at Rainy Lake Falls ..	590	.....	Rainy River
Manitou	at Devil's Cascades....	435	.....	" .....
Seine	at Skunk Rapids.....	2,300	.....	" .....
Turtle	at Mountain Rapids...	1,760	.....	" .....
Wabigoon.....	near Quibell	2,400	.....	" .....
"	at Wabigoon Falls	3,120	.....	Kenora.....

Eagle River at Eagle River

Location—At the highway bridge 1,000 feet south of the C.P. Ry. crossing of the river, and above the "Cascades," in the Township of Aubrey, District of Kenora. This river is a branch of the Wabigoon River.

Records Available—Discharge measurements from January, 1914, to October, 1916. Daily gauge heights February 12, 1914, to October 31, 1916.

Drainage Area—970 square miles.

Gauge—Vertical staff with enamelled face screwed to a 2 x 4 inch scantling, which is nailed to the south side of the bridge crib near the south-east corner, and next to the left bank of the river. The zero on the gauge (elev. 1,172.99) is referred to a bench mark (elev. 1,176.56, C.P.R. datum) painted on a point of rock on the left bank a few feet south-west of gauge.

Channel and Control—Straight for about 100 feet above the station, with the water flowing slowly. Below the section the channel is straight for about 20 feet, with the water running swiftly to the Cascades. The banks are clean, high, rocky and not liable to overflow. The bed consists of rock, and is permanent. At extreme highwater the flow is cut up by the bridge piers, but under normal conditions the flow is all through one channel.

Discharge Measurements—Made from the highway bridge with a small Price current meter.

Winter Flow—Not affected by ice. The water at the section never freezes.

Accuracy—The station rating curve is well defined. Fluctuation in gauge heights is occasionally augmented by wind on Eagle Lake. This is in every way an exceptionally good station.

Observer—J. Nelson, Eagle River.

Discharge Measurements of Eagle River at Eagle River in 1916

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916							
June 13....	Taylor, J. R.	95	391	5.84	1177.66	2,283	.....
" 17....	"	95	351	5.13	1177.24	1,801	.....
" 17....	"	95	351	4.95	1177.24	1,737	.....
July 5....	"	95	320	4.88	1176.91	1,564	.....
" 5....	"	95	320	4.90	1176.91	1,570	.....

Daily Gauge Height and Discharge of Eagle River at Eagle River for 1915-6

Drainage Area 970 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.	Dis-charge	Sec-ft.	Gauge Ht.	Dis-charge	Sec-ft.	Gauge Ht.	Dis-charge	Sec-ft.	Gauge Ht.	Dis-charge	Sec-ft.	Gauge Ht.	Dis-charge	Sec-ft.	Gauge Ht.	Dis-charge	Sec-ft.	Gauge Ht.	Dis-charge	Sec-ft.	Gauge Ht.	Dis-charge	Sec-ft.	Gauge Ht.	Dis-charge	Sec-ft.	Gauge Ht.	Dis-charge	Sec-ft.						
1	1173.93	270	1174.09	310	1174.16	329	1174.32	376	1174.26	358	1174.16	329	1175.74	970	1177.74	2110	1176.74	1510	1176.11	1155	1175.32	780	1175.37	800												
2	1173.91	265	1174.09	310	1174.14	324	1174.37	392	1174.24	352	1174.16	329	1175.82	1010	1177.78	2140	1176.74	1510	1176.11	1155	1175.28	760	1175.39	810												
3	1173.89	261	1174.11	316	1174.16	329	1174.39	399	1174.24	352	1174.16	329	1175.95	1070	1177.82	2160	1176.74	1510	1176.16	1180	1175.32	780	1175.39	810												
4	1173.86	254	1174.11	316	1174.16	329	1174.39	399	1174.22	346	1174.16	329	1176.03	1115	1177.87	2190	1176.70	1490	1176.16	1180	1175.37	800	1175.37	800												
5	1173.82	245	1174.14	324	1174.18	335	1174.39	399	1174.22	346	1174.14	324	1176.11	1155	1177.91	2220	1176.66	1470	1176.07	1135	1175.37	800	1175.37	800												
6	1173.82	245	1174.14	324	1174.20	340	1174.39	399	1174.22	346	1174.14	324	1176.24	1220	1177.99	2260	1176.61	1440	1176.11	1155	1175.45	835	1175.32	780												
7	1173.89	261	1174.11	316	1174.22	346	1174.37	392	1174.22	346	1174.14	324	1176.32	1265	1177.95	2240	1176.57	1410	1176.11	1155	1175.49	855	1175.32	780												
8	1173.93	270	1174.09	310	1174.22	346	1174.37	392	1174.22	346	1174.14	324	1176.41	1320	1177.95	2240	1176.53	1390	1176.07	1135	1175.53	875	1175.32	780												
9	1173.99	285	1174.09	316	1174.24	352	1174.34	383	1174.22	346	1174.11	316	1176.49	1360	1177.91	2220	1176.45	1340	1176.11	1155	1175.49	855	1175.32	780												
10	1174.05	300	1174.07	305	1174.26	358	1174.34	383	1174.24	352	1174.11	316	1176.49	1360	1177.87	2190	1176.41	1320	1176.11	1155	1175.53	875	1175.28	760												
11	1174.05	300	1174.07	305	1174.28	364	1174.34	383	1174.24	352	1174.11	316	1176.57	1410	1177.82	2160	1176.32	1265	1175.99	1095	1175.49	855	1175.26	750												
12	1174.03	295	1174.14	324	1174.30	370	1174.37	392	1174.24	352	1174.14	324	1176.64	1510	1177.86	2070	1176.20	1200	1175.91	1055	1175.41	820	1175.16	705												
13	1174.03	295	1174.14	324	1174.30	370	1174.34	383	1174.24	352	1174.14	324	1176.78	1540	1177.57	2010	1176.16	1180	1175.91	1055	1175.41	820	1175.16	705												
14	1174.03	295	1174.16	329	1174.32	376	1174.37	392	1174.22	346	1174.14	324	1176.91	1620	1177.49	1960	1176.07	1135	1176.87	1035	1175.41	820	1175.16	705												
15	1174.07	305	1174.16	329	1174.32	376	1174.34	383	1174.22	346	1174.20	340	1176.91	1620	1177.41	1920	1175.99	1095	1175.82	1010	1175.41	820	1175.16	705												
16	1174.07	305	1174.16	329	1174.32	376	1174.37	392	1174.22	346	1174.14	324	1177.07	1710	1177.32	1860	1176.07	1135	1175.78	990	1175.37	800	1175.16	705												
17	1174.02	292	1174.14	324	1174.30	370	1174.37	392	1174.22	346	1174.14	324	1177.16	1770	1177.32	1860	1176.07	1135	1175.78	990	1175.37	800	1175.16	705												
18	1174.02	292	1174.14	324	1174.30	370	1174.37	392	1174.22	346	1174.14	324	1177.16	1770	1177.32	1860	1176.07	1135	1175.78	990	1175.37	800	1175.16	705												
19	1174.03	294	1174.14	324	1174.30	370	1174.34	383	1174.20	340	1174.16	324	1177.16	1770	1177.32	1860	1176.07	1135	1175.78	990	1175.37	800	1175.16	705												
20	1174.03	294	1174.14	324	1174.30	370	1174.34	383	1174.20	340	1174.16	324	1177.16	1770	1177.32	1860	1176.07	1135	1175.78	990	1175.37	800	1175.16	705												
21	1174.11	316	1174.14	324	1174.30	370	1174.32	376	1174.20	340	1174.16	324	1177.32	1860	1177.07	1710	1176.24	1220	1175.57	890	1175.37	800	1175.14	700												
22	1174.12	317	1174.14	324	1174.30	370	1174.32	376	1174.20	340	1174.16	324	1177.32	1860	1177.07	1710	1176.24	1220	1175.57	890	1175.37	800	1175.14	700												
23	1174.14	324	1174.11	316	1174.28	364	1174.30	370	1174.18	335	1174.87	585	1177.41	1920	1176.91	1620	1176.28	1245	1175.45	835	1175.37	800	1175.11	685												
24	1174.14	324	1174.11	316	1174.28	364	1174.30	370	1174.18	335	1174.87	585	1177.41	1920	1176.91	1620	1176.28	1245	1175.45	835	1175.37	800	1175.11	685												
25	1174.14	324	1174.11	316	1174.28	364	1174.30	370	1174.18	335	1175.07	695	1177.49	1960	1176.82	1560	1176.24	1220	1175.41	820	1175.32	780	1175.11	685												
26	1174.15	317	1174.09	310	1174.26	358	1174.30	370	1174.18	335	1175.16	705	1177.49	1960	1176.87	1590	1176.16	1180	1175.32	780	1175.37	800	1175.09	675												
27	1174.15	317	1174.09	310	1174.26	358	1174.30	370	1174.18	335	1175.28	760	1177.53	1990	1176.87	1590	1176.11	1155	1175.32	780	1175.39	810	1175.11	685												
28	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
29	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
30	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
31	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
32	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
33	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
34	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
35	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
36	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
37	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
38	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
39	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
40	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
41	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
42	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32	780	1175.39	810	1175.09	675												
43	1174.16	318	1174.11	316	1174.27	359	1174.31	371	1174.19	336	1175.37	800	1177.57	2010	1176.91	1620	1176.11	1155	1175.32																	

Monthly Discharge of Eagle River at Eagle River for 1915-6

Drainage Area, 970 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	324	245	293	.33	.25	.30	.33
December "	329	305	320	.34	.31	.33	.38
January .. (1916)	376	324	357	.39	.33	.37	.43
February	399	358	382	.41	.37	.39	.42
March	358	324	343	.37	.33	.35	.40
April	930	316	469	.96	.33	.48	.54
May	2,080	970	1,597	2.14	1.00	1.65	1.90
June	2,260	1,560	1,932	2.33	1.61	1.99	2.22
July	1,510	1,095	1,267	1.56	1.13	1.31	1.51
August	1,180	760	992	1.22	.78	1.02	1.18
September	875	760	815	.90	.78	.84	.94
October.....	810	665	729	.84	.69	.75	.86
The year	2,260	245	793	2.33	.25	.82	11.16

English River at Caribou Falls

Location—About 1,200 feet above Caribou Falls, the last falls on the river, and about five miles from the Winnipeg River, District of Kenora.

Records Available—Discharge measurements from May, 1914, to October, 1916.

Drainage Area—21,600 square miles.

Gauge—Vertical staff located on the left bank of the river 25.6 feet north of a blazed jack pine, which is used as the initial point for soundings. The zero on the gauge (elevation 100.00) is referred to a bench mark (elevation 109.45) painted on a point of rock 16 feet south of the blazed jack pine.

Channel and Control—Above the station the channel takes a 90 degree curve to the right, thence following comparatively straight to the head of the falls. Both banks are high, rocky and wooded, and not liable to overflow. The bed of the stream is rocky, with large boulders or protruding shelves of rock and practically permanent. The water at the left bank is still, backflow existing at higher stages. The natural control is wide and unobstructed.

Discharge Measurements—Made from a canoe, and occasionally through ice, with a small Price current meter or from raft in winter.

Winter Flow—Ice conditions make little or no difference, the channel being rarely frozen over.

Accuracy—A well defined curve has been secured here.

Discharge Measurements of English River at Caribou Falls in 1916

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916 June 26....	Carmichael, R.M	245	10,819	2.39	105.04	25,845	.....

Daily Gauge Height and Discharge of English River at Ear Falls for 1915-6
Drainage Area, 11,700 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge	Gauge Ht.	Dis- charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	119.41	6920	119.87	8680	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.29	6570	121.41	14740	122.62	19480	122.62	19480	121.22	13980		
2	119.41	6920	119.87	8680	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.29	6570	121.41	14740	122.62	19480	122.62	19480	121.22	13980		
3	119.41	6920	119.87	8680	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.29	6570	121.41	14740	122.62	19480	122.62	19480	121.22	13980		
4	119.45	7050	119.95	9000	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.45	7040	121.62	15580	122.62	19480	122.62	19480	121.22	13980		
5	119.45	7050	119.95	9000	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.45	7040	121.62	15580	122.62	19480	122.62	19480	121.22	13980		
6	119.45	7050	119.95	9000	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.45	7040	121.62	15580	122.62	19480	122.62	19480	121.22	13980		
7	119.45	7050	119.95	9000	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.45	7040	121.62	15580	122.62	19480	122.62	19480	121.22	13980		
8	119.37	6810	119.87	8680	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.62	7680	121.87	16580	122.62	19480	122.62	19480	120.97	12980		
9	119.37	6810	119.87	8680	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.62	7680	121.87	16580	122.62	19480	122.62	19480	120.97	12980		
10	119.37	6810	119.87	8680	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.62	7680	121.87	16580	122.62	19480	122.62	19480	120.97	12980		
11	119.37	6810	119.87	8680	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.62	7680	121.87	16580	122.62	19480	122.62	19480	120.97	12980		
12	119.37	6810	119.87	8680	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.62	7680	121.87	16580	122.62	19480	122.62	19480	120.97	12980		
13	119.37	6810	119.87	8680	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.62	7680	121.87	16580	122.62	19480	122.62	19480	120.97	12980		
14	119.37	6810	119.87	8680	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.62	7680	121.87	16580	122.62	19480	122.62	19480	120.97	12980		
15	119.37	6810	119.87	8680	119.62	7680	119.37	6800	119.04	5910	118.70	5160	119.62	7680	121.87	16580	122.62	19480	122.62	19480	120.97	12980		
16	119.29	6570	119.74	8160	119.58	7520	119.24	6430	118.83	5430	118.79	5340	119.95	9000	122.20	17900	122.93	20720	121.95	16900	120.95	12900		
17	119.29	6570	119.74	8160	119.58	7520	119.24	6430	118.83	5430	118.79	5340	119.95	9000	122.20	17900	122.93	20720	121.95	16900	120.95	12900		
18	119.33	6690	119.70	8000	119.56	7440	119.22	6380	118.79	5340	118.83	5430	120.24	10160	122.37	18580	122.72	19880	121.87	16580	120.83	12420		
19	119.33	6690	119.70	8000	119.56	7440	119.22	6380	118.79	5340	118.83	5430	120.24	10160	122.37	18580	122.72	19880	121.87	16580	120.83	12420		
20	119.33	6690	119.70	8000	119.56	7440	119.22	6380	118.79	5340	118.83	5430	120.24	10160	122.37	18580	122.72	19880	121.87	16580	120.83	12420		
21	119.33	6690	119.70	8000	119.56	7440	119.22	6380	118.79	5340	118.83	5430	120.24	10160	122.37	18580	122.72	19880	121.87	16580	120.83	12420		
22	119.20	6320	119.66	7840	119.45	7040	119.20	6320	118.79	5340	118.91	5600	120.62	11680	122.54	19160	122.72	19880	121.72	15980	120.77	12210		
23	119.20	6320	119.66	7840	119.45	7040	119.20	6320	118.79	5340	118.91	5600	120.62	11680	122.54	19160	122.72	19880	121.72	15980	120.77	12210		
24	119.20	6320	119.66	7840	119.45	7040	119.20	6320	118.79	5340	118.91	5600	120.62	11680	122.54	19160	122.72	19880	121.72	15980	120.77	12210		
25	119.95	9000	119.62	7680	119.41	6920	119.12	6110	118.79	5340	118.95	5700	120.87	12580	122.62	19480	122.72	19880	121.72	15980	120.62	11680		
26	119.95	9000	119.62	7680	119.41	6920	119.12	6110	118.79	5340	118.95	5700	120.87	12580	122.62	19480	122.72	19880	121.72	15980	120.62	11680		
27	119.95	9000	119.62	7680	119.41	6920	119.12	6110	118.79	5340	118.95	5700	120.87	12580	122.62	19480	122.72	19880	121.72	15980	120.62	11680		
28	119.95	9000	119.62	7680	119.41	6920	119.12	6110	118.79	5340	118.95	5700	120.87	12580	122.62	19480	122.72	19880	121.72	15980	120.62	11680		
29	119.87	8680	119.62	7680	119.41	6920	119.12	6110	118.79	5340	118.95	5700	120.87	12580	122.62	19480	122.72	19880	121.72	15980	120.62	11680		
30	119.87	8680	119.62	7680	119.41	6920	119.12	6110	118.79	5340	118.95	5700	120.87	12580	122.62	19480	122.72	19880	121.72	15980	120.62	11680		
31	119.87	8680	119.62	7680	119.41	6920	119.12	6110	118.79	5340	118.95	5700	120.87	12580	122.62	19480	122.72	19880	121.72	15980	120.62	11680		

Monthly Discharge of English River at Ear Falls for 1915-6

Drainage Area, 11,700 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
November..(1915)	9,000	6,320	7,255	.77	.54	.62	.69
December ..	9,000	7,680	8,231	.77	.66	.70	.81
January ...1916)	7,680	6,920	7,445	.66	.59	.64	.74
February	6,800	6,110	6,532	.58	.52	.56	.60
March	5,910	5,240	5,513	.51	.45	.47	.54
April	5,700	5,160	5,371	.49	.44	.46	.51
May	13,260	6,570	9,592	1.13	.56	.82	.95
June	19,960	14,740	18,135	1.71	1.26	1.55	1.73
July	20,720	19,480	19,875	1.77	1.66	1.70	1.96
August	19,480	15,100	17,389	1.66	1.29	1.49	1.72
September	13,980	11,440	12,743	1.19	.98	1.09	1.22
October	9,840	8,520	9,109	.84	.73	.78	.90
The year	20,720	5,240	10,935	1.77	.45	.93	12.66

Daily Gauge Height of English River at Lac Seul for 1915-6

Day.	Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.
1	105.27	105.73	105.77	105.44	105.10	104.83	105.33	108.17	109.63	109.41	107.81	106.66
2	105.27	105.77	105.77	105.44	105.10	104.83	105.39	108.25	109.63	109.36	107.73	106.77
3	105.27	105.77	105.77	105.44	105.02	104.77	105.45	108.31	109.63	109.26	107.69	106.56
4	105.23	105.77	105.77	105.44	105.02	104.77	105.48	108.46	109.63	109.21	107.65	106.58
5	105.27	105.77	105.73	105.44	105.02	104.75	105.56	108.50	109.65	109.19	107.61	106.61
6	105.31	105.77	105.73	105.35	105.02	104.75	105.62	108.58	109.61	109.11	107.56	106.49
7	105.35	105.81	105.73	105.35	105.02	104.73	105.64	108.71	109.63	109.13	107.51	106.43
8	105.44	105.81	105.73	105.35	105.02	104.69	105.81	108.75	109.61	109.06	107.46	106.33
9	105.44	105.81	105.69	105.35	105.02	104.69	105.83	108.83	109.61	109.01	107.41	106.33
10	105.44	105.81	105.69	105.35	105.02	104.69	106.23	108.96	109.73	108.96	107.36	106.31
11	105.44	105.85	105.69	105.35	105.02	104.64	106.43	108.98	109.88	109.06	107.31	106.29
12	105.44	105.85	105.65	105.35	105.02	104.69	106.43	109.06	109.90	108.96	107.26	106.24
13	105.52	105.85	105.65	105.35	105.02	104.71	106.48	109.13	109.88	108.91	107.21	106.21
14	105.52	105.85	105.65	105.35	105.02	104.73	106.48	109.21	109.88	108.86	107.21	106.21
15	105.52	105.85	105.62	105.35	104.94	104.69	106.56	109.25	109.90	108.73	107.16	106.16
16	105.52	105.85	105.62	105.35	104.94	104.71	106.73	109.33	109.88	108.66	107.11	106.16
17	105.56	105.85	105.60	105.27	104.92	104.77	106.85	109.42	109.88	108.58	107.01	106.13
18	105.56	105.85	105.52	105.27	104.94	104.81	106.83	109.54	109.94	108.56	106.96	106.01
19	105.60	105.85	105.52	105.27	104.96	104.83	106.89	109.56	110.03	108.49	106.91	106.01
20	105.60	105.85	105.52	105.19	104.85	104.85	106.98	109.56	110.07	108.47	106.86	106.01
21	105.60	105.77	105.52	105.19	104.85	104.94	107.00	109.58	109.92	108.41	107.11	106.01
22	105.64	105.77	105.52	105.19	104.85	105.00	107.04	109.58	109.94	108.36	107.01	105.95
23	105.64	105.77	105.52	105.19	104.79	105.00	107.14	109.58	109.92	108.26	106.94	105.91
24	105.64	105.77	105.52	105.27	104.77	105.02	107.39	109.71	109.94	108.26	106.91	105.87
25	105.67	105.77	105.52	105.19	104.77	105.10	107.52	109.67	109.84	108.18	106.88	105.93
26	105.67	105.77	105.52	105.10	104.85	105.17	107.60	109.67	109.86	108.16	106.83	105.83
27	105.69	105.77	105.52	105.10	104.85	105.23	107.73	109.71	109.51	108.06	106.79	105.76
28	105.69	105.77	105.52	105.10	104.83	105.23	107.85	109.71	109.51	108.03	106.76	105.71
29	105.69	105.77	105.52	105.10	104.85	105.38	107.91	109.71	109.51	107.99	106.71	105.78
30	105.69	105.77	105.52	.....	104.85	105.35	107.98	109.67	109.46	107.91	106.69	105.71
31	.....	.....	105.52	.....	104.83	.....	108.06	.....	109.41	107.86	.....	105.71

English River at Manitou Falls

Location—About 800 feet above the first chute of the Manitou Falls, and five miles below the mouth of the Mattawa River and the old Mattawa H. B. Co's. Post. Cedar River enters the English River $\frac{1}{2}$ mile below the metering section.

Records Available—Discharge measurements from July, 1914, to October, 1916. Bi-weekly gauge heights interpolated from Ear Falls gauge heights, February 1st, 1915, to October 31st, 1916.

Drainage Area—14,600 square miles.

Gauge—Vertical staff with enamelled face screwed to a 6-inch pine post and firmly wedged and wired to the right bank 15 feet south of a 2-inch jack pine, which is used as the initial point for soundings. The zero on the gauge (elev. 89.42) is referred to a bench mark (elev. 100.43) painted on a point of rock 2.5 feet south-east of the initial point.

Channel and Control—About 1,200 feet above the station the channel begins to narrow down and turns to the right out of the lake above. It is comparatively straight thence to the station and falls. Both banks are high, rocky and wooded, and will not overflow. The bed of the stream is rocky and permanent. The current is slow above and moderately swift at the section.

Discharge Measurements—Made from a canoe with a small Price current meter.

Remarks—The very steady regimen of the English River, together with the lack of gauge readers, makes it possible and necessary to apply the gauge heights at Ear Falls to the gauge at Manitou Falls. Gauge readings taken on nearly the same day were used in making up curves for the two stations, and the results obtained justify the assumptions made. No allowance is made for "lag."

Discharge Measurements of English River at Manitou Falls in 1916

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916							
July 30....	Taylor, J. R.....	247	5,801	3.73	101.86	21,656	.....
.. 30....	.....	247	5,801	3.75	101.86	21,742	.....

Daily Gauge Height and Discharge of English River at Manitou Falls for 1915-6

Drainage Area, 14,600 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	92.31	8250	93.55	9860	92.86	8970	92.20	8110	91.35	7030	90.45	5980	92.00	7850	98.07	16250	101.75	21400	97.50	15450				
2	92.45	8440			92.86	8970	92.20	8110			90.45	5980	92.45	8430			101.75	21400						
3															98.73	17170			97.47	15410				
4																								
5																								
6																								
7																								
8																								
9	92.20	8110	93.55	9860	92.86	8970	92.10	7980	91.25	6910	90.45	5980	92.90	9020	99.55	18320	101.75	21400	100.92	20240	96.75	14400		
10																								
11																								
12																								
13																								
14																								
15																								
16	92.00	7850																						
17																								
18																								
19	92.10	7980																						
20																								
21																								
22																								
23	91.80	7590																						
24																								
25																								
26	93.75	10120																						
27																								
28																								
29																								
30	93.55	9860																						
31																								

NOTE.—Gauge heights interpolated from Ear Falls and discharges applied from Manitou Falls rating curve.

Monthly Discharge of English River at Manitou Falls for 1915-6

Drainage Area, 14,600 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November. (1915)	19,120	7,850	8,525	.69	.54	.58	.65
December. "	10,120	8,970	9,455	.69	.61	.65	.75
January ..(1916)	8,970	8,270	8,770	.61	.57	.60	.69
February	8,110	7,270	7,807	.56	.50	.53	.57
March	7,030	6,090	6,488	.48	.42	.44	.51
April	6,730	5,980	6,281	.46	.41	.43	.48
May	14,750	7,850	10,872	1.01	.54	.74	.85
June	21,890	16,250	19,940	1.50	1.11	1.37	1.53
July	22,660	21,400	20,811	1.55	1.47	1.43	1.65
August	21,400	16,670	19,097	1.47	1.14	1.31	1.51
September	15,450	12,720	14,158	1.06	.87	.97	1.08
October	11,110	9,710	10,276	.76	.67	.70	.81
The year	22,660	5,980	12,313	1.55	.41	.84	11.43

English River near Oak Falls

Location—About one mile above the upper fall of Oak Falls, and about one-half mile below Wilcox Lake, District of Kenora.

Records Available—Discharge measurements from August, 1914, to October, 1916. Bi-weekly gauge heights interpolated from observations at Ear Falls, February 1st, 1915, to October 31st, 1916.

Drainage Area—15,570 square miles.

Gauge—Vertical staff with enamelled face screwed to a cedar post and firmly wedged in rock on the right bank 200 feet above the metering section. The zero on the gauge (elev. 194.09) is referred to a bench mark (elev. 200.00 painted on a rock in the river near the right bank and 20 feet above the final point for soundings. The initial point for soundings is located on the left bank, and consists of the head of a nail driven in the side of a 12-inch poplar blazed and marked I.P., N. 70° W.

Channel and Control—Straight for about 300 feet above and ½ mile below the station. Both banks are high, rocky and wooded, and not liable to overflow. The bed of the stream is rocky and practically permanent. The current is sluggish above and moderately swift below the station, a small rapid existing about 800 feet below.

Discharge Measurements—Made from a canoe with a small Price current meter.

Remarks—The very steady regimen of the English River, together with the lack of gauge readers, makes it possible and necessary to apply the gauge heights at Ear Falls to the gauge at Oak Falls. Gauge readings taken on nearly the same day were used in making up curves for the two stations, and the results obtained justify the assumptions made. No allowance is made for lag.

Discharge Measurements of English River near Oak Falls in 1916

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916 Aug. 2....	Taylor, J. R....	443	8,348	2.83	200.30	235.95	.....

Monthly Discharge of English River near Oak Falls for 1916

Drainage Area, 15,570 Square Miles

Month	Discharge in Second-foot			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	10,980	8,100	9,140	.70	.52	.59	.66
December. "	10,980	8,330	10,050	.70	.53	.64	.74
January ... (1916)	9,630	8,820	9,410	.62	.57	.60	.69
February	8,640	7,820	8,320	.55	.50	.53	.57
March	7,620	6,710	7,070	.49	.43	.45	.52
April.	7,280	6,620	6,990	.47	.43	.49	.55
May.	15,680	8,500	11,641	1.01	.55	.75	.86
June.	23,720	17,400	21,542	1.52	1.12	1.33	1.54
July	24,600	23,200	23,650	1.58	1.49	1.52	1.75
August	23,720	17,880	20,716	1.52	1.15	1.33	1.53
September	16,480	13,410	14,945	1.06	.86	.96	1.07
October.	11,860	10,500	11,109	.76	.67	.71	.82
The year.	24,600	6,620	13,260	1.58	.43	.85	11.57

English River at Sturgeon Falls

Location—About 300 feet above the lowest of the three falls known as Sturgeon Falls, District of Kenora, and about 30 miles above the Winnipeg River.

Records Available—Discharge measurements from June, 1914.

Drainage Area—Not measured.

Gauge—Vertical staff with enamelled face, screwed to a 5" hewn spruce post firmly wedged and braced to the left bank about 150 feet below the metering section. The zero on the gauge (elevation 91.52) is referred to a bench mark (elevation 100.00) painted on the left bank 10 feet from the initial point and two feet below the line of section. The initial point for soundings is a nail driven in the side of a 6-inch blazed poplar on the left bank, and marked I.P., N. 10° E.

Channel and Control—There are deep bays on both sides of the river above the station, from which the channel takes a gentle curve to the left, thence flowing comparatively straight and narrowing to the station and falls. The bed is composed of rock with a little gravel in the centre, and practically permanent. Both banks are high, rocky and wooded, and will not overflow. The velocity is low at the right bank, and very slight backflow exists at the left.

Discharge Measurements—Made from a canoe with a small Price current meter.

(a) Reading taken 70 ft. above regular section.

Monthly Discharge of Footprint River at Rainy Lake Falls for 1915-6

Drainage Area, 590 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	83	79	80	.14	.13	.14	.16
December “	83	83	83	.14	.14	.14	.16
January.. (1916)	83	83	83	.14	.14	.14	.16
February	83	83	83	.14	.14	.14	.15
March	108	83	92	.18	.14	.16	.18
April	640	104	229	1.08	.18	.39	.45
May	1,410	680	1,070	2.39	1.15	1.81	2.09
June	1,300	725	1,061	2.20	1.23	1.80	2.01
July.....	735	403	594	1.25	.68	1.01	1.16
August	390	252	325	.66	.43	.55	.63
September.....	252	165	212	.43	.28	.36	.40
October	159	119	137	.27	.20	.23	.27
The year	1,410	79	338	2.39	.14	.57	7.76

Manitou River at Devil's Cascades

Location—About 150 feet above the old dam, at the head of the Devil's Cascades, Rainy River District.

Records Available—Monthly discharge measurements from July, 1914. Daily gauge heights, July 15, 1914, to June 30th, 1916.

Drainage Area—435 square miles.

Gauge—An inclined steel staff, graduated in feet and inches, and located on the face of the old dam. The zero of the gauge is at an elevation of 139.38 feet referred to a bench mark (elevation 147.37) painted on a rock 1 foot east of the initial point for soundings.

Channel—Straight for about 150 feet above and 400 feet below the station. The right bank is high, rocky, wooded, and not liable to overflow, but the left bank is low and wooded, with a gradually rising bank, which is not liable to overflow unless the dam is operated. The bed of the stream is composed of rock, and the current is slow, one channel existing at all stages.

Discharge Measurements—Made from canoe or ice with a small Price current meter.

Winter Flow—The relation of gauge height to discharge is affected by ice during the cold period, and measurements are made to determine the winter flow.

Regulation—Several dams exist on the river between the section and Manitou Lake, which are not in operation at present. The operation of the dam just above the station causes fluctuations at the gauge.

Accuracy—A fairly well-defined rating curve has been developed, and records are considered fair.

Discharge Measurements of Manitou River at Devil's Cascades in 1916

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916							
June 4....	Taylor, J. R. ...	117	797	2.02	146.89	1613	.....
July 12....	"	116	699	1.25	145.99	874	.....

Seine River at Skunk Rapids

Location—About 200 feet above Skunk Rapids, and 1 mile upstream from the Canadian Northern Ry. bridge. One-half mile north of the C. N. Ry. tracks, and 1 mile west of La Seine Station, in the District of Rainy River.

Records Available—Discharge measurements from August, 1914. Daily gauge heights, Sept. 22, 1914, to April 30, 1915, and Oct. 1st, 1915, to Oct. 31st, 1916. ..

Drainage Area—2,300 square miles.

Gauge—Vertical steel staff gauge with enamelled face, graduated in feet and inches, and located near La Seine station, on the C. N. Ry. The zero on the gauge is at an elevation of 1,138.21 feet, which is referred to a bench mark (elevation 1,152.73) painted on a large boulder, on the right bank of the river, 6 feet from a 6-inch poplar tree used as a final point for soundings. The initial point is on the left bank and consists of a 2-inch spruce tree, blazed and marked I.P. with white paint. "H. E. P. Comm." is painted on the rock directly below the spruce tree.

Channel and Control—Straight for about 500 feet above and 200 feet below the station to the rapids. The right bank of the river curves into a point at the rapids forming a narrow channel. The velocity of the river is slow and the banks are high, rocky and wooded. This land has been burnt over, but most of the trees are still standing. The bed of the stream is sandy and clean, with a few boulders near the right bank. One channel exists at all stages.

Discharge Measurements—Made from a canoe with a small Price current meter.

Winter Flow—The relation of gauge height to discharge is affected by ice during the winter months and measurements are made to determine the winter flow.

Accuracy—Open water rating curve is fairly well defined and estimates are considered good.

Observer—Wm. Clark, Flanders.

Discharge Measurements of Seine River at Skunk Rapids in 1916

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916							
June 6....	Taylor, J. R....	290	3,045	2.39	101.45	7261	.....
" 6....	"	209	3,045	2.40	101.45	7305	.....
July 13....	"	206	2,449	1.33	98.93	3258	.....

Daily Gauge Height of Seine River at Skunk Rapids for 1915-6

Drainage Area, 2,300 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge			
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.				
1	97.39	.....		96.93	.....		95.97	.....		95.34	.....		94.97	.....		95.05	.....		99.64	.....		102.22	.....		99.49	.....		97.81	.....		96.78	.....		97.43	.....
2	97.39	.....		96.89	.....		95.97	.....		95.30	.....		94.97	.....		95.14	.....		99.70	.....		102.14	.....		99.43	.....		97.74	.....		96.76	.....		97.43	.....
3	97.40	.....		96.89	.....		95.97	.....		95.30	.....		94.97	.....		95.18	.....		99.78	.....		101.93	.....		99.43	.....		97.70	.....		96.81	.....		97.43	.....
4	97.41	.....		96.80	.....		95.93	.....		95.26	.....		94.97	.....		95.22	.....		99.89	.....		101.80	.....		99.35	.....		97.64	.....		97.85	.....		97.41	.....
5	97.41	.....		96.80	.....		95.93	.....		95.22	.....		94.93	.....		95.22	.....		100.10	.....		101.72	.....		99.26	.....		97.55	.....		96.85	.....		97.33	.....
6	97.41	.....		96.80	.....		95.95	.....		95.22	.....		94.89	.....		95.22	.....		100.18	.....		101.45	.....		99.24	.....		97.60	.....		96.85	.....		97.27	.....
7	97.44	.....		96.72	.....		95.89	.....		95.18	.....		94.89	.....		95.22	.....		100.39	.....		101.31	.....		99.18	.....		97.55	.....		96.85	.....		97.26	.....
8	97.47	.....		96.72	.....		95.89	.....		95.14	.....		94.84	.....		95.26	.....		100.68	.....		101.14	.....		99.14	.....		97.47	.....		96.85	.....		97.26	.....
9	97.47	.....		96.72	.....		95.87	.....		95.14	.....		94.84	.....		95.30	.....		100.93	.....		101.14	.....		99.08	.....		97.41	.....		96.83	.....		97.26	.....
10	97.52	.....		96.51	.....		95.84	.....		95.10	.....		94.84	.....		95.30	.....		101.14	.....		101.03	.....		99.03	.....		97.39	.....		96.81	.....		97.26	.....
11	97.60	.....		96.47	.....		95.87	.....		95.05	.....		94.80	.....		95.39	.....		101.14	.....		100.93	.....		98.99	.....		97.31	.....		96.78	.....		97.26	.....
12	97.70	.....		96.47	.....		95.80	.....		95.01	.....		94.80	.....		95.43	.....		101.14	.....		100.91	.....		98.93	.....		97.24	.....		96.76	.....		97.24	.....
13	97.72	.....		96.41	.....		95.76	.....		95.01	.....		94.80	.....		95.45	.....		101.34	.....		100.91	.....		98.89	.....		97.20	.....		96.70	.....		97.22	.....
14	97.39	.....		96.34	.....		95.76	.....		95.01	.....		94.80	.....		95.89	.....		101.43	.....		100.76	.....		98.85	.....		97.18	.....		96.74	.....		97.20	.....
15	97.30	.....		96.26	.....		95.72	.....		94.97	.....		94.80	.....		96.14	.....		101.43	.....		100.68	.....		98.78	.....		97.12	.....		96.76	.....		97.18	.....
16	97.22	.....		96.22	.....		95.68	.....		94.97	.....		94.80	.....		96.55	.....		101.60	.....		100.64	.....		98.72	.....		97.12	.....		96.76	.....		97.18	.....
17	97.14	.....		96.22	.....		95.64	.....		94.97	.....		94.80	.....		96.72	.....		101.64	.....		100.51	.....		98.66	.....		97.18	.....		96.76	.....		97.16	.....
18	97.05	.....		96.16	.....		95.64	.....		94.97	.....		94.80	.....		97.05	.....		101.72	.....		100.39	.....		98.60	.....		97.12	.....		96.76	.....		97.16	.....
19	97.14	.....		96.14	.....		95.64	.....		94.97	.....		94.80	.....		97.84	.....		101.78	.....		100.31	.....		98.51	.....		97.14	.....		96.76	.....		97.18	.....
20	97.14	.....		96.10	.....		95.64	.....		94.97	.....		94.80	.....		98.39	.....		101.82	.....		100.16	.....		98.43	.....		97.08	.....		96.76	.....		97.18	.....
21	97.05	.....		96.05	.....		95.57	.....		94.97	.....		94.80	.....		98.64	.....		101.89	.....		99.97	.....		98.35	.....		97.08	.....		97.01	.....		97.18	.....
22	97.05	.....		96.05	.....		95.55	.....		94.97	.....		94.80	.....		98.72	.....		101.89	.....		99.93	.....		98.31	.....		97.16	.....		97.18	.....		97.18	.....
23	97.05	.....		96.01	.....		95.55	.....		94.97	.....		94.80	.....		99.05	.....		101.97	.....		99.89	.....		98.24	.....		97.16	.....		97.26	.....		97.18	.....
24	96.97	.....		96.01	.....		95.51	.....		94.97	.....		94.80	.....		99.14	.....		101.91	.....		99.89	.....		98.18	.....		97.12	.....		97.51	.....		97.12	.....
25	96.97	.....		96.01	.....		95.51	.....		94.97	.....		94.80	.....		99.18	.....		101.89	.....		99.85	.....		98.16	.....		97.10	.....		97.60	.....		97.03	.....
26	96.97	.....		95.99	.....		95.47	.....		94.97	.....		94.80	.....		99.22	.....		101.84	.....		99.76	.....		98.10	.....		97.08	.....		97.60	.....		97.01	.....
27	96.97	.....		95.97	.....		95.47	.....		94.97	.....		94.89	.....		99.34	.....		101.80	.....		99.68	.....		98.08	.....		97.03	.....		97.60	.....		97.01	.....
28	96.97	.....		95.97	.....		95.47	.....		94.97	.....		94.89	.....		99.43	.....		101.80	.....		99.74	.....		98.01	.....		96.99	.....		97.51	.....		97.01	.....
29	96.97	.....		95.97	.....		95.47	.....		94.97	.....		94.93	.....		99.51	.....		101.80	.....		99.60	.....		97.92	.....		96.91	.....		97.51	.....		96.99	.....
30	96.93	.....		95.97	.....		95.43	.....		94.97	.....		94.97	.....		99.55	.....		101.80	.....		99.55	.....		97.88	.....		96.87	.....		97.45	.....		96.99	.....
31	.....	.....		95.97	.....		95.39	.....		.....	.....		95.01	.....		.....	.....		101.89	.....		.....	.....		97.84	.....		96.85	.....		.....	.....		97.01	.....

Turtle River at Mountain Rapids

Location—About 300 feet above Mountain Rapids, and about 8 miles from the Olive Mine, 12 miles from Mine Centre, which is on the C. N. Ry., in the Rainy River District.

Records Available—Monthly discharge measurements from August, 1914. Daily gauge heights, Aug. 9, 1914, to Oct. 31, 1916.

Drainage Area—1,760 square miles.

Gauge—Vertical steel staff gauge with enamelled face, graduated in feet and inches, and fastened on a crib pier at the C. N. Ry. saw mill, 12 miles from the station. The gauge is located 1,000 feet south of the mouth of Little Turtle River, on the east shore of Little Turtle Lake. Zero on gauge (elevation 83.45) is referred to a bench mark established on a rock with white paint, on the left bank of the river, four feet south of a blazed pine tree, marked I.P. with white paint, which is used as the initial point for soundings. The elevation of this bench mark is 96.00, which is referred to another bench mark (assumed elevation 100.00) established on a rock with white paint, 35 feet north-east of the gauge, at the C. N. Ry. Mill at Mine Centre.

Channel and Control—Straight for about 1,000 feet above and below the station, the water running slowly. The banks are high, wooded and rocky. The bed of the stream is sandy and clean, one channel existing at all stages. The river is used extensively for log driving, and the log jams in Otter Falls affect the section somewhat.

Discharge Measurements—Made from a canoe with a small Price current meter.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice and measurements are made during the winter to determine the flow.

Accuracy—Open water rating curve fairly well defined between gauge heights 91.50 and 94.50. The relation of gauge height to discharge during the log-driving period is affected by back water from log jams.

Observer—Hiram Smith, Mine Centre.

Discharge Measurements of Turtle River at Mountain Rapids in 1916

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916							
May 24....	Taylor, J. R....	183	3,668	1.40	96.60	5,143	.....
" 24....	"	183	3,668	1.41	96.60	5,187	.....
July 13....	"	177	3,510	.88	95.33	3,089 (a)	.....

(a) River almost filled with logs below rapids.

Daily Gauge Height of Turtle River at Mountain Rapids for 1915-6

Drainage Area 1,760 Square Miles.

Date	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.	
	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.
1	91.33	.....	91.58	.....	91.31	.....	91.31	.....	91.16	.....	91.14	.....	.....	.....	96.64	.....	95.62	.....	93.66	.....	92.92	.....	94.00	.....
2	91.31	.....	91.56	.....	91.31	.....	91.31	.....	91.14	.....	91.14	.....	.....	.....	96.81	.....	95.81	.....	93.62	.....	92.89	.....	93.95	.....
3	91.22	.....	91.56	.....	91.31	.....	91.31	.....	91.14	.....	91.16	.....	.....	.....	96.89	.....	95.81	.....	93.60	.....	92.87	.....	93.90	.....
4	91.22	.....	91.52	.....	91.31	.....	91.29	.....	91.14	.....	91.16	.....	.....	.....	96.89	.....	95.82	.....	93.59	.....	97.81	.....	93.83	.....
5	91.20	.....	91.51	.....	91.31	.....	91.29	.....	91.14	.....	91.16	.....	.....	.....	96.97	.....	95.87	.....	93.54	.....	92.87	.....	93.74	.....
6	91.22	.....	91.51	.....	91.31	.....	91.27	.....	91.14	.....	91.14	.....	.....	.....	96.97	.....	95.89	.....	93.58	.....	92.97	.....	93.67	.....
7	91.18	.....	91.47	.....	91.31	.....	91.27	.....	91.14	.....	91.14	.....	.....	.....	96.97	.....	95.89	.....	93.56	.....	93.08	.....	93.62	.....
8	91.39	.....	91.47	.....	91.31	.....	91.27	.....	91.16	.....	91.14	.....	.....	.....	96.97	.....	95.89	.....	93.54	.....	93.14	.....	93.57	.....
9	91.45	.....	91.47	.....	91.31	.....	91.27	.....	91.16	.....	91.14	.....	.....	.....	96.72	.....	95.81	.....	93.48	.....	93.08	.....	93.50	.....
10	91.51	.....	91.47	.....	91.31	.....	91.24	.....	91.16	.....	91.14	.....	.....	.....	96.72	.....	95.74	.....	93.52	.....	92.93	.....	93.41	.....
11	91.70	.....	91.47	.....	91.31	.....	91.24	.....	91.16	.....	91.16	.....	.....	.....	96.69	.....	95.72	.....	93.47	.....	92.89	.....	93.29	.....
12	91.99	.....	91.47	.....	91.31	.....	91.24	.....	91.16	.....	91.22	.....	.....	.....	96.64	.....	95.67	.....	93.41	.....	92.99	.....	93.29	.....
13	92.06	.....	91.45	.....	91.31	.....	91.24	.....	91.14	.....	91.47	.....	.....	.....	96.70	.....	95.37	.....	93.37	.....	93.14	.....	93.23	.....
14	92.10	.....	91.43	.....	91.31	.....	91.22	.....	91.14	.....	91.56	.....	.....	.....	96.65	.....	95.29	.....	93.30	.....	93.17	.....	93.15	.....
15	92.12	.....	91.43	.....	91.31	.....	91.22	.....	91.14	.....	91.64	.....	.....	.....	96.65	.....	95.22	.....	93.24	.....	93.17	.....	93.10	.....
16	92.10	.....	91.43	.....	91.29	.....	91.22	.....	91.12	.....	.....	.....	.....	.....	96.58	.....	95.16	.....	93.17	.....	93.14	.....	93.05	.....
17	92.10	.....	91.39	.....	91.29	.....	91.22	.....	91.12	.....	.....	.....	.....	.....	96.56	.....	94.99	.....	93.21	.....	93.14	.....	92.95	.....
18	92.06	.....	91.39	.....	91.29	.....	91.22	.....	91.12	.....	.....	.....	.....	.....	96.49	.....	94.91	.....	93.20	.....	93.15	.....	92.90	.....
19	91.97	.....	91.39	.....	91.29	.....	91.20	.....	91.12	.....	.....	.....	.....	.....	96.43	.....	94.83	.....	93.14	.....	93.20	.....	92.89	.....
20	91.94	.....	91.39	.....	91.29	.....	91.20	.....	91.10	.....	.....	.....	.....	.....	96.27	.....	94.74	.....	93.12	.....	93.22	.....	92.89	.....
21	91.97	.....	91.39	.....	91.29	.....	91.18	.....	91.10	.....	.....	.....	.....	.....	96.01	.....	94.66	.....	93.06	.....	93.43	.....	92.90	.....
22	91.87	.....	91.35	.....	91.29	.....	91.18	.....	91.10	.....	.....	.....	.....	.....	95.81	.....	94.52	.....	93.12	.....	93.72	.....	92.88	.....
23	91.81	.....	91.35	.....	91.29	.....	91.18	.....	91.10	.....	.....	.....	.....	.....	95.66	.....	94.41	.....	93.14	.....	93.97	.....	92.84	.....
24	91.74	.....	91.37	.....	91.29	.....	91.18	.....	91.10	.....	.....	.....	.....	.....	95.58	.....	94.29	.....	93.14	.....	94.18	.....	92.81	.....
25	91.72	.....	91.37	.....	91.31	.....	91.18	.....	91.10	.....	.....	.....	.....	.....	95.49	.....	94.16	.....	93.16	.....	94.22	.....	92.62	.....
26	91.68	.....	91.37	.....	91.31	.....	91.18	.....	91.10	.....	.....	.....	.....	.....	95.47	.....	94.06	.....	93.14	.....	94.26	.....	92.56	.....
27	91.64	.....	91.37	.....	91.31	.....	91.18	.....	91.10	.....	.....	.....	.....	.....	95.47	.....	93.99	.....	93.14	.....	94.26	.....	92.55	.....
28	91.63	.....	91.37	.....	91.31	.....	91.18	.....	91.10	.....	.....	.....	.....	.....	95.47	.....	93.91	.....	93.13	.....	94.24	.....	92.54	.....
29	91.64	.....	91.35	.....	91.31	.....	91.16	.....	91.10	.....	.....	.....	.....	.....	95.49	.....	93.83	.....	93.08	.....	94.22	.....	92.53	.....
30	91.62	.....	91.35	.....	91.33	.....	.....	.....	91.10	.....	.....	.....	.....	.....	95.53	.....	93.81	.....	93.02	.....	94.08	.....	92.53	.....
31	.....	.....	91.31	.....	91.33	.....	.....	.....	91.14	.....	.....	.....	.....	.....	.....	.....	93.76	.....	92.96	.....	.....	.....	92.60	.....

Wabigoon River near Quibell

Location—About 200 feet above the second fall from the G.T.P. Railway bridge, and ½ mile below the bridge which spans the first fall. One mile east from Quibell Station, Township of Wabigoon, District of Kenora.

Records Available—Discharge measurements from June, 1914, to October, 1915. Daily gauge heights from August 1, 1914, to October 31, 1916.

Drainage Area—2,400 square miles.

Gauge—Vertical staff with enamelled face screwed to a 5-inch hewn spruce post firmly wedged and braced to the rock on the right bank of the river 1,200 feet above the metering station. The zero on the gauge (elev. 1,061.64) is referred to a bench mark (elev. 1,069.46, G.T.P. datum) painted on a point of rock just below the gauge. The initial point for soundings is a spike driven in the rock on the left bank.

Channel and Control—1,200 feet above the station the channel takes a sharp bend to the right, thence running comparatively straight to the station and falls. The water is sluggish above and moderately swift at the station. The banks are high, rocky and wooded. The bed of the stream is full of boulders and crevices. One channel exists at all stages.

Discharge Measurements—Made from canoe and ice with a small Price current meter.

Regulation—The Dryden Timber and Power Company operate a plant on the Wabigoon River at Dryden, which runs 24 hours per day with the exception of Sundays and holidays.

Winter Flow—Ice formation is very heavy here, and the winter flow is somewhat disturbed by it.

Accuracy—Rating curve fairly well defined, and estimates for open water flow are good.

Observer—D. C. Warner, Quibell.

Discharge Measurements of Wabigoon River near Quibell, in 1916

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916							
June 14....	Carmichael, R.M.	248	3,890	1.43	1070.64	5,548 (a)	.....
“ 14....	“	248	3,890	1.57	1070.59	6,121 (b)	.....
July 7....	“	92	959	2.95	1066.59	2,832	.....
“ 7....	“	92	959	2.91	1066.59	2,788	.....
“ 7....	“	92	959	2.88	1066.59	2,764	.....

(a) Backwater 30 ft. from left bank due to two large boulders. Trees growing in water 15 ft. from left bank. Not taken at regular section.
(b) Discharge increased by strong wind down stream. Not taken at regular section.

Daily Gauge Height of Wabigoon River near Quibell for 1915-6

Drainage Area 2,400 Square Miles

Date	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.	
1	1063.20			1063.60			1063.22			1063.85			1063.37			1063.20			1068.97			1071.31			1069.24			1065.74			1064.24			1065.29		
2	1063.12			1063.52			1062.22			1063.87			1063.41			1063.18			1069.06			1071.24			1069.18			1065.72			1064.22			1065.33		
3	1063.06			1063.47			1063.22			1063.89			1063.68			1063.14			1069.05			1071.22			1068.72			1065.64			1064.20			1065.79		
4	1063.04			1063.43			1063.20			1063.91			1063.76			1063.10			1069.06			1071.18			1068.14			1065.56			1064.72			1066.10		
5	1062.97			1063.39			1063.20			1063.79			1063.72			1063.12			1069.18			1071.14			1067.85			1065.41			1065.39			1066.20		
6	1062.92			1063.39			1063.18			1063.81			1063.81			1063.10			1069.29			1071.12			1067.22			1065.39			1065.39			1066.24		
7	1063.12			1063.39			1063.16			1063.81			1063.83			1063.12			1069.35			1071.06			1066.64			1065.33			1065.33			1066.43		
8	1063.43			1063.37			1063.14			1063.81			1063.87			1063.14			1069.31			1071.04			1066.31			1065.31			1065.26			1066.41		
9	1063.95			1063.39			1063.14			1063.89			1063.81			1063.14			1069.31			1071.04			1066.31			1065.31			1065.26			1066.41		
10	1064.43			1063.39			1063.14			1063.85			1063.72			1063.12			1069.47			1071.02			1066.16			1065.24			1065.16			1066.39		
11	1064.81			1063.39			1063.14			1063.85			1063.72			1063.12			1069.54			1070.99			1066.06			1065.16			1065.06			1066.06		
12	1064.93			1063.39			1063.14			1063.85			1063.72			1063.12			1069.66			1070.93			1065.97			1065.12			1064.91			1065.68		
13	1065.14			1063.35			1063.24			1063.89			1063.52			1063.31			1069.87			1070.68			1065.81			1064.91			1064.83			1064.72		
14	1064.99			1063.31			1063.33			1063.87			1063.54			1063.39			1069.89			1070.60			1065.72			1064.91			1064.62			1064.83		
15	1064.89			1063.33			1063.35			1063.85			1063.47			1063.47			1069.85			1070.47			1065.64			1064.72			1064.49			1064.56		
16	1064.60			1063.33			1063.33			1063.81			1063.47			1063.47			1069.91			1070.39			1065.56			1064.70			1064.41			1064.47		
17	1064.43			1063.33			1063.31			1063.72			1063.47			1063.47			1069.91			1070.31			1065.47			1064.70			1064.35			1064.43		
18	1064.26			1063.33			1063.33			1063.64			1063.47			1063.31			1070.31			1070.06			1065.56			1064.68			1064.31			1064.41		
19	1064.14			1063.33			1063.31			1063.60			1063.47			1063.39			1070.39			1069.97			1066.33			1064.66			1064.26			1064.37		
20	1064.08			1063.26			1063.39			1063.54			1063.47			1063.39			1070.43			1069.91			1067.14			1064.62			1064.22			1064.35		
21	1063.97			1063.24			1063.47			1063.45			1063.43			1063.39			1070.45			1069.85			1067.41			1064.60			1064.60			1064.35		
22	1063.91			1063.24			1063.54			1063.43			1063.37			1063.39			1070.47			1069.66			1067.33			1064.56			1065.31			1064.33		
23	1063.85			1063.24			1063.56			1063.43			1063.35			1063.39			1070.39			1069.56			1067.24			1064.54			1065.54			1064.31		
24	1063.76			1063.22			1063.60			1063.43			1063.31			1063.35			1070.32			1069.47			1067.02			1064.54			1065.83			1064.29		
25	1063.68			1063.20			1063.64			1063.39			1063.22			1063.39			1070.68			1069.37			1066.85			1064.49			1065.89			1064.29		
26	1063.64			1063.18			1063.70			1063.39			1063.18			1063.31			1071.02			1069.35			1066.66			1064.47			1065.93			1064.26		
27	1063.64			1063.18			1063.72			1063.35			1063.16			1063.54			1071.06			1069.31			1066.41			1064.45			1065.92			1064.26		
28	1063.64			1063.18			1063.76			1063.33			1063.14			1063.60			1071.10			1069.33			1066.26			1064.39			1065.58			1064.31		
29	1063.62			1063.20			1063.79			1063.31			1063.16			1063.47			1071.20			1069.33			1066.20			1064.35			1065.43			1064.31		
30	1063.62			1063.22			1063.81			1063.22			1063.22			1063.72			1071.22			1069.33			1065.97			1064.31			1065.43			1064.31		
31	.....			1063.24			1063.81			.....			1063.22			1063.72			1071.31			.....			1065.85			1064.26			.....			1064.35		

Wabigoon River at Wabigoon Falls

Location—About 100 feet above Wabigoon Falls, the last fall on the river, and three miles from its junction with the English River, District of Kenora.

Records Available—Discharge measurements from June, 1914, to October, 1915.

Drainage Area—3,120 square miles.

Gauge—Vertical staff with enamelled face screwed to a 5-inch hewn spruce post firmly wedged and braced to the left bank about 200 feet above the metering section. The zero on the gauge (elev. 111.37) is referred to a bench mark (elev. 120.07), consisting of a nail driven in the head of a 4-inch tamarac stump two feet up-stream from the gauge. Another bench mark (elev. 118.51) is painted on a point of rock on the left bank 75 feet below the metering section. The initial point for soundings is on the right bank, the edge of a 5-inch blazed poplar tree, and marked I. P., S. 12° E.

Channel and Control—Straight for about $\frac{1}{2}$ mile above and 100 feet below the station to the falls. Both banks are high, rocky and wooded, and will not overflow. The bed of the stream is composed of rock, with a few boulders and weeds at the right bank. The current is sluggish at and above the station, but swift just below the section.

Discharge Measurements—Made from canoe and ice with a small Price current meter.

Regulation—The Dryden Timber & Power Company operate a plant at Dryden, Ontario. The power is used for the mill and for lighting the town. This plant runs 24 hours per day with the exception of Sundays and holidays, when it runs 12 hours. Part of the flow is utilized for operating a saw mill on the opposite side of the river.

Accuracy—The station rating curve is fairly well defined.

Regular Stations

SOUTH-WESTERN ONTARIO DISTRICT

River	Location	Drain- age Area Sq. Miles	Township	County
Ausable	near Arkona	408	West Williams.....	Middlesex
Beaver	near Kimberley.....	100	Euphrasia	Grey
Bighead	at Meaford	132	St. Vincent	"
Black	near Washago	585	Rama	Ontario
Credit.....	at Cataract Jct	85	Caledon	Peel
Maitland	at Ben Miller.....	950	Colborne	Huron
Nottawasaga.....	near Nicolston.....	416	Essa	Simcoe
Rocky Saugeen.....	near Markdale.....	96	Glenelg.....	Grey
Saugeen.....	near Port Elgin	1,565	Saugeen.....	Bruce
"	near Walkerton.....	895	Brant.....	"
Sydenham	near Owen Sound.....	71	Derby.....	Grey
Thames, main stream	near Byron.....	1,270	Delaware.....	Middlesex
" north branch	near Fanshaw.....	650	London.....	"
" south branch	near Ealing.....	515	London and West- minster.....	"

Ausable River near Arkona

Location—At the highway bridge at Marsh’s Mills, about two miles east of the village of Arkona, near lot 22, concession 7, Township of West Williams, County of Middlesex.

Records Available—Discharge measurements from May 14th, 1915, to October 31st, 1916. Gauge readings from June 24th, 1915, to October 31st, 1916.

Drainage Area—408 square miles.

Gauge—Vertical staff gauge 0 to 12 feet on the downstream side of the first pier. The elevation of the zero of the gauge is 0.00 and a B.M. is established on top of the right girder, elevation 23.31.

Channel and Control—The discharge measurements are made in the medium fast water between the two rapids. The flow is confined between the abutments at all stages. The stream bed is composed of shale, and will not shift. The channel is straight for 400 yards above and below the section.

Discharge Measurements—Made from the bridge, except in low water, when they are made at a wading section 300 feet above the bridge.

Accuracy—Discharge measurements have not yet been made covering the range of stage.

Observer—Milton Marsh, Arkona P.O.

Discharge Measurements of Ausable River near Arkona in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 9....	Yeates, W.	29	45	1.34	1.54	60	.....
1916							
Jan. 14....	“	89	416	2.23	3.42	927(a)	.....
Feb. 24....	“	54	151	.83	1.87	95 (b)	.....
Mar. 30....	“	104	752	7.52	6.75	5650 (c)	.....
Aug. 24....	“	39	57	1.68	1.73	96(d)	.....

- (a) Slush at low-water section; control clear.
- (b) Ice and slush on control; section clear.
- (c) Control clear; co-efficient used to reduce observed velocities.
- (d) Not at regular section.

Daily Gauge Height and Discharge of Ausable River near Arkona for 1915-6

Drainage Area, 408 Square Miles

Date	November		December		January		February		March		April		May		June		July		August		September		October	
	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	1.44	48	3.17	820	2.60	475	5.71	3705	1.71	62	5.42	3230	2.54	442	3.79	1310	1.63	88	1.25	24	1.17	19	1.33	32
2	1.38	38	3.00	710	4.96	2550	4.93	2505	1.71	62	5.00	2600	2.50	420	3.04	755	1.58	76	1.25	24	1.21	21	1.29	27
3	1.44	48	3.00	710	5.71	3705	2.96	685	1.71	62	4.25	1750	2.56	453	2.75	560	1.52	64	1.25	24	1.21	21	1.29	27
4	1.44	48	2.87	630	4.79	2350	2.46	298	1.67	54	3.77	1295	2.79	585	2.52	432	1.50	60	1.23	22	1.21	21	1.29	27
5	1.54	68	2.37	352	5.79	3845	2.31	244	1.67	54	3.43	1000	2.83	610	2.58	464	1.50	60	1.23	24	1.21	21	1.27	26
6	1.54	68	2.35	342	7.38	7000	2.31	244	1.67	54	3.21	845	2.71	535	2.44	387	1.50	60	1.24	23	1.17	19	1.25	24
7	1.54	68	2.29	316	5.04	2660	2.23	212	1.75	70	2.96	685	2.50	442	2.44	387	1.48	56	1.21	21	1.26	25	1.25	24
8	1.54	68	2.29	316	4.34	1840	2.27	228	1.92	110	2.77	570	2.52	431	3.96	1460	1.46	52	1.21	21	1.33	32	1.25	24
9	1.54	68	2.27	308	3.39	975	2.29	236	1.92	110	2.62	486	2.64	497	3.19	830	1.42	44	1.21	21	1.36	35	1.23	22
10	1.53	66	2.25	300	2.56	453	2.31	244	1.92	110	2.52	431	3.33	930	2.83	610	1.39	38	1.25	24	1.31	29	1.19	20
11	1.51	62	2.25	300	2.39	360	2.31	244	1.92	110	2.45	393	5.25	2980	2.96	685	1.37	36	1.22	22	1.25	24	1.17	19
12	1.51	62	2.27	308	2.64	520	2.31	244	1.87	98	2.54	442	4.29	1790	2.44	387	1.37	36	1.23	22	1.21	21	1.17	19
13	1.51	62	2.23	292	4.88	2455	1.98	125	1.85	92	3.02	720	3.37	960	2.28	312	1.37	36	1.25	24	1.21	21	1.29	27
14	1.51	62	2.29	316	3.13	790	1.98	125	1.85	92	4.42	1920	2.85	620	2.17	268	1.37	36	1.25	24	1.21	21	1.33	32
15	1.51	62	2.31	324	2.71	535	1.93	112	1.88	100	3.85	1365	4.83	2400	2.08	232	1.37	36	1.25	24	1.21	21	1.33	32
16	1.52	64	2.25	300	2.56	453	1.89	102	1.90	105	3.46	1020	4.50	2010	2.00	200	1.37	36	1.25	24	1.21	21	1.31	29
17	1.52	64	2.19	276	2.39	360	1.94	115	1.92	110	3.29	905	3.92	1430	2.29	316	1.37	36	1.21	21	1.21	21	1.25	24
18	1.52	64	2.27	308	2.42	292	1.92	110	1.92	110	3.29	905	3.60	1140	2.50	420	1.33	32	1.21	21	1.21	21	1.33	32
19	1.52	64	2.27	308	2.42	376	1.94	115	1.92	110	3.21	845	3.31	915	2.50	420	1.33	32	1.27	26	1.21	21	1.33	32
20	3.00	710	3.05	745	2.29	316	1.91	108	1.92	110	2.98	700	3.46	1020	2.46	398	1.33	32	1.30	28	1.21	21	1.62	85
21	3.00	710	2.81	595	2.38	356	1.92	105	1.87	98	3.04	735	3.19	835	2.29	316	1.31	29	1.25	24	1.21	21	1.89	157
22	2.83	610	2.98	700	4.71	2250	1.90	105	1.85	92	3.44	1010	3.00	710	2.12	248	1.31	29	1.33	32	1.21	21	1.62	85
23	2.62	486	2.89	645	5.96	4130	1.88	100	1.83	88	3.44	1010	4.17	1670	1.96	184	1.29	27	2.00	200	1.21	21	1.50	60
24	2.54	442	3.06	745	5.21	2915	1.85	92	1.75	70	3.21	845	3.46	1020	1.87	151	1.27	26	1.71	108	1.21	21	1.44	48
25	2.31	324	3.23	860	4.38	1880	1.85	92	1.80	80	2.95	685	2.83	610	2.04	216	1.25	24	1.46	108	1.21	21	1.33	32
26	2.25	300	3.10	770	3.46	1020	1.83	88	2.42	375	2.85	620	2.54	442	2.06	224	1.44	48	1.32	32	1.21	21	1.33	32
27	2.37	352	2.98	745	3.34	940	1.79	78	5.17	2855	2.92	660	2.57	352	1.89	157	1.50	60	1.31	29	1.21	21	1.33	32
28	3.17	860	3.06	700	5.71	3705	1.71	62	7.58	7420	3.25	875	2.30	420	1.81	133	1.38	38	1.30	28	1.33	32	1.33	32
29	3.37	960	2.85	620	5.21	2915	1.71	62	7.83	7940	3.23	860	2.73	550	1.69	102	1.31	29	1.25	24	1.33	32	1.33	32
30	3.71	1240	2.89	645	3.96	1465	.....	.....	6.71	5590	2.83	610	4.92	2500	1.67	98	1.27	26	1.25	24	1.33	32	1.33	32
31	.....	.....	2.81	595	6.38	4920	.....	.....	5.75	3775	.....	.....	4.73	2280	.....	.....	1.27	26	1.21	21	.....	.....	1.33	32

Monthly Discharge of Ausable River near Arkona for 1915-6

Drainage Area 408 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	1,240	38	272	3.06	.09	.67	.75
December	860	276	525	2.11	.68	1.29	1.49
January ..(1916)	7,000	292	1,900	17.16	.72	4.65	5.36
February	3,705	62	372	9.08	.15	.91	.98
March	7,940	54	975	19.46	.13	2.38	2.74
April	3,230	393	1,000	7.92	.96	2.45	2.73
May	2,980	352	1,030	7.30	.86	2.53	2.92
June	1,460	98	422	3.58	.24	1.03	1.15
July	88	26	42	.22	.06	.10	.12
August	200	21	33	.49	.05	.08	.09
September	35	19	23	.09	.05	.05	.06
October	157	19	37	.38	.05	.09	.10
The year	7,940	19	555	19.46	.05	1.36	18.51

Beaver River near Kimberley

Location—At Hill's Bridge, about 2 miles above Kimberley, on the south half of lot 2, concession 5, Township of Euphrasia, County of Grey.

Records Available—Discharge measurements at Weber's Bridge September, 1914, to January, 1915. Discharge measurements and daily gauge heights April 25, 1915, to October 31, 1916, at Hill's Bridge.

Drainage Area—100 square miles.

Gauge—Vertical staff 0 to 6 feet on tree on left bank 20 feet downstream from bridge. Zero on gauge is 0.00.

Channel and Control—Channel straight above and below for a distance of 200 feet. The banks and control are permanent under ordinary conditions. The bed is composed of stones and gravel, one channel existing at all stages.

Discharge Measurements—Made from the bridge during the high-water period, and from a permanent wading section located 20 feet above the bridge for the low-water stages.

Regulation—The Hydro-Electric Power Commission's power plant located three-quarters of a mile upstream, though a twenty-four hour power, has a marked effect on the river stage at this section.

Accuracy—The rating curve is fairly well defined, but open-water estimates are subject to errors, due to fluctuations in stage caused by operation of power plant.

Observer—A. Hill, Kimberley, P.O.

Discharge Measurements of Beaver River near Kimberley in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Dec. 8....	Cunnington, G...	56	40	2.05	.96	83	.....
1916							
Jan. 14....	" ..	58	66	1.94	1.37	128	.....
Feb. 8....	Roberts, E.	57	90	2.19	1.92	197 (a)	.....
" 9....	"	57	93	2.40	2.00	223 (a)	.....
" 24....	Cunnington, G...	56	73	2.50	1.75	184 (a)	.....
June 13..	Roberts, E.	57	62	2.18	1.39	135	.....
Oct. 4....	Yeates, W.	57	22	1.74	.62	38	.....

(a) Ice at island above section diverting current to left bank.

Monthly Discharge of Beaver River near Kimberley for 1915-6

Drainage Area, 100 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	124	49	70	1.24	.49	.70	.78
December ..	132	53	73	1.32	.53	.73	.84
January .. (1916)	474	124	258	4.74	1.24	2.58	2.97
February	508	147	263	5.08	1.47	2.63	2.84
March	435	82	206	4.35	.82	2.06	2.37
April	520	210	330	5.20	2.10	3.30	3.68
May	254	137	191	2.54	1.37	1.91	2.20
June	174	72	129	1.74	.72	1.29	1.44
July	77	45	58	.77	.45	.58	.67
August	49	41	45	.49	.41	.45	.52
September	49	31	39	.49	.31	.39	.44
October	72	33	51	.72	.33	.51	.59
The year	520	31	142	5.20	.31	1.42	19.33

Bighead River at Meaford

Location—At the Georgian Bay Milling & Power Co. grist mill bridge outside of the Town of Meaford, near lot 15, concession 5, Township of St. Vincent, County of Grey.

Records Available—Discharge measurements and daily gauge heights from June 10, 1915, to Oct. 31, 1916.

Drainage Area—132 square miles.

Gauge—Vertical staff 0 to 12 feet on right abutment. Elevation of zero on gauge is 0.00.

Channel and Control—The channel is straight for 100 feet above and 500 feet below the gauging station. The bed of the stream is composed of stones and gravel, and is shifting. During the freshet stage, banks and control are not stationary. During a freshet in January, 1916, the stream scoured badly, completely changing the rating curve.

Discharge Measurements—Made at the bridge, also at a wading station 100 feet downstream.

Regulation—Low-water flow is controlled by the Georgian Bay Milling & Power Co.'s dam located four miles upstream. As the plant is usually run for 24 hours each day, except Sunday, the fluctuations will not be great.

Accuracy—The rating curve has not yet been well defined for new conditions.

Observer—Wilbert Baker, Meaford.

Discharge Measurements of Bighead River at Meaford in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Dec. 10....	Cunnington, G...	29	33	2.00	2.04	66	.....
1916							
Jan. 21....	" "	45	110	1.23	3.29	135 (a)	.....
Feb. 11....	Roberts, E.....	65	76	2.68	2.56	205 (b)	.....
June 11....	" "	95	77	1.98	1.83	152 (c)	.....
Oct. 4....	Yeates, W.....	13	7	.87	.96	6	.....
" 4....	" "	43	29	.20	.96	6	.....

(a) Reading not taken at regular section; river jammed; ice on control.

(b) Section badly scoured.

(c) Section completely scoured; control washed out.

Daily Gauge Height and Discharge of Bighead River at Meaford for 1915-6

Discharge Area 132 Square Miles

Date	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	2.08	99	2.54	191	2.46	76	2.69	194	2.33	184	5.77	630	2.44	198	2.00	141	1.67	98	1.35	56	1.23	41	0.62	0
2	1.75	47	2.64	211	3.17	190	2.17	163	2.33	184	5.19	555	2.60	219	2.00	141	1.62	92	1.33	54	1.27	46	1.27	46
3	2.02	88	2.60	203	3.29	190	2.17	163	2.33	184	3.42	326	2.58	216	1.94	133	1.62	92	1.33	54	1.25	43	1.25	43
4	1.94	74	2.58	199	2.92	187	2.10	154	2.33	184	3.25	303	2.50	206	1.92	131	1.67	98	1.27	46	1.25	43	0.67	0
5	2.00	84	2.50	183	3.79	241	2.48	203	2.29	179	3.14	289	2.39	192	1.89	127	1.60	89	1.25	43	1.25	43	0.69	0
6	2.08	99	2.52	187	3.67	241	2.58	216	2.27	176	2.83	249	2.33	184	1.83	119	1.58	86	1.23	41	1.23	41	1.31	51
7	2.00	84	2.46	175	3.23	241	2.42	196	2.17	163	2.58	216	2.17	163	1.75	108	1.52	79	1.27	46	1.19	36	1.25	43
8	2.00	84	2.37	157	3.04	167	2.42	196	2.27	176	2.56	214	2.19	166	1.73	106	1.50	76	1.35	56	0.92	1	0.67	0
9	2.00	84	2.37	157	3.25	194	2.42	196	2.27	176	2.56	214	2.19	166	1.73	106	1.50	76	1.33	54	1.17	33	1.23	41
10	2.00	84	2.27	121	3.25	212	2.52	209	2.25	172	2.96	201	2.17	163	1.75	108	1.50	76	1.33	54	0.83	1	0.67	0
11	2.06	85	2.33	103	3.67	249	2.50	206	2.35	186	2.52	209	2.17	163	1.83	119	1.42	66	1.31	51	1.19	33	1.27	46
12	2.10	103	2.42	121	3.08	149	2.50	206	2.42	196	2.94	263	2.10	154	1.74	107	1.35	55	1.27	46	1.17	33	1.29	49
13	2.00	84	2.54	140	3.75	258	2.50	206	2.37	189	3.00	271	2.08	151	1.75	108	1.33	54	1.27	46	1.12	27	1.56	84
14	2.08	99	2.54	140	3.25	212	2.64	224	2.33	184	3.54	341	2.08	151	1.75	108	1.33	54	1.25	43	1.14	29	1.58	86
15	2.08	99	2.58	158	3.00	131	2.75	239	2.25	172	3.25	303	2.00	141	1.73	106	1.33	54	1.25	43	1.12	27	1.75	108
16	2.14	111	2.54	140	3.00	140	2.75	239	2.35	186	3.00	271	2.00	141	1.73	106	1.33	54	1.25	43	1.12	27	1.75	108
17	2.27	137	2.56	140	3.08	140	2.64	224	2.33	184	2.98	268	2.00	141	1.73	106	1.33	54	1.25	43	0.67	0	1.85	121
18	2.17	117	2.54	140	3.08	140	2.50	206	2.33	184	2.81	246	2.00	141	1.73	106	1.33	54	1.25	43	1.19	36	1.75	108
19	2.21	125	2.50	121	3.06	140	2.33	184	2.33	184	2.35	186	1.96	136	2.89	257	1.33	54	1.25	43	1.17	33	1.77	111
20	2.56	195	2.50	121	3.04	140	2.33	184	2.33	184	2.77	241	1.92	131	2.65	231	1.42	66	1.25	43	1.25	43	1.73	106
21	2.46	175	2.50	121	3.29	140	2.46	206	2.29	179	3.17	293	1.92	131	2.56	214	1.37	59	1.25	43	1.25	43	1.67	98
22	2.48	179	2.50	103	5.87	613	2.67	228	2.25	172	4.25	432	1.92	131	2.33	184	1.33	54	1.23	41	1.27	46	1.64	94
23	2.44	171	2.37	94	3.17	121	2.60	219	2.33	184	4.50	466	1.87	124	2.33	184	1.33	54	1.19	36	1.25	43	1.58	86
24	2.46	175	2.52	121	2.87	85	2.50	206	2.35	186	4.00	401	1.83	119	2.08	151	1.31	51	1.17	33	0.69	0	1.50	76
25	2.46	175	2.54	121	2.87	67	2.35	186	2.37	189	3.77	371	1.83	119	2.00	141	1.27	46	1.27	46	1.27	46	1.50	76
26	2.46	175	2.54	130	2.96	103	2.33	184	2.37	189	2.87	254	1.83	119	1.94	133	1.25	43	1.25	43	1.27	46	1.46	71
27	2.25	133	2.56	132	3.08	131	2.33	184	2.37	189	2.87	254	1.83	119	1.79	114	1.25	43	1.25	43	1.25	43	1.42	66
28	2.42	167	2.56	136	3.37	158	2.37	189	6.25	693	2.25	172	2.58	216	1.73	106	1.25	43	1.25	43	1.25	43	1.42	66
29	2.50	183	2.64	140	3.19	167	2.33	184	4.92	520	2.25	172	2.29	179	1.67	98	1.25	43	1.25	43	1.29	49	1.42	66
30	2.54	191	2.87	149	3.19	185	.....	.....	4.75	498	2.25	172	2.06	149	1.67	98	1.25	43	1.25	43	1.25	43	1.52	79
31	.....	.....	3.00	158	3.29	190	.....	.....	4.79	505	.....	.....	2.00	141	.....	.....	1.39	62	1.23	41	.....	.....	1.50	76

Monthly Discharge of Bighead River at Meaford for 1915-6

Drainage Area, 132 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	195	47	124	1.48	.36	.94	1.05
December. "	211	94	146	1.60	.71	1.11	1.28
January.. (1916)	285	67	182	2.16	.51	1.38	1.59
February	239	154	201	1.81	1.17	1.52	1.64
March	693	163	234	5.25	1.23	1.77	2.04
April	630	172	292	4.77	1.30	2.21	2.47
May	219	119	158	1.66	.90	1.20	1.38
June	276	98	146	2.09	.74	1.11	1.24
July	98	43	64	.74	.33	.48	.55
August	56	33	46	.42	.25	.35	.40
September	49	0	34	.37	.00	.26	.29
October	121	0	64	.92	.00	.48	.55
The year....	693	0	140	5.25	.00	1.06	14.43

Black River near Washago

Location—At the highway bridge known as Kennedy's Bridge, about 5 miles south-east of the Town of Washago, on lot 1, concession G, Township of Rama, County of Ontario.

Records Available—Discharge measurements at first bridge from August, 1913, to January, 1914. Discharge measurements at Kennedy's Bridge from February, 1914, and daily gauge heights from May 5, 1915, to October 31, 1916.

Drainage Area—585 square miles.

Gauge—Vertical staff 0 to 12 feet on tree on left bank. Elevation of zero is 19.00, which is referred to a B.M. (elevation 30.00) on tie rod on downstream side of bridge, latter used for water elevations since gauge went out in spring of 1916.

Channel and Control—The channel is straight for 150 feet above and 700 feet below the gauging section. The banks and control can be considered permanent, as the velocity here is never very high. The bed of the stream is composed of rock.

Discharge Measurements—Made from the bridge and wading section 50 feet below.

Winter Flow—Owing to the somewhat sluggish flow at this section, ice from December to March forms to a great thickness, and relation of gauge height to discharge is seriously affected during that period. Measurements are made to determine the winter flow.

Regulation—The flow at this section during May, June and July is controlled to a large extent by logging dams above. The operation of gates at these dams causes fluctuations in gauge heights, amounting to several feet at the gauge. At times logs lodge below section, causing considerable backwater.

Accuracy—For three months in the early summer the river stage is subject to large fluctuations, and the accuracy of the discharge depends upon accuracy of mean daily gauge heights. Rating curve not well defined at all stages.

Observer—John Carrick, Washago.

Discharge Measurements of Black River near Washago in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 1....	Roberts, E.	119	492	.65	21.67	322	.....
1916							
Jan. 20....	Cunnington, G...	119	459	1.09	22.73	486 (a)	.....
Feb. 22....	" "	119	632	1.39	24.00	883 (b)	.....
Oct. 3....	Yeates, W.	31	43	1.09	19.80	47 (c)	.....

(a) Ice measurement.

(b) Ice-covered above and below section; small ice jam below.

(c) Measurement made at wading section.

Daily Gauge Height and Discharge of Black River near Washago, for 1915-6

Drainage Area 585 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge			
	Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.		Feet	Sec.-ft.	Feet
1	21.69	327		23.10	850	22.46	375		26.77	2770	23.64	720	28.63	4740	25.71	2550	24.50	1660	21.79	357	20.67	107		19.79	46	19.92	51									
2	21.64	312		23.10	850	22.46	360		26.85	2640	23.58	700	28.88	4930	25.56	2440	23.90	1260	21.73	339	20.54	94		19.81	46	19.90	50									
3	21.62	306		22.98	790	22.42	369		26.73	2760	23.56	690	28.77	4850	25.62	2480	23.50	1050	21.75	345	20.63	103		19.86	48	19.88	49									
4	21.60	300		22.81	615	22.42	375		26.73	2760	23.46	690	28.77	4850	25.62	2440	23.40	1000	21.79	357	20.54	94		19.86	48	19.83	47									
5	21.69	327		23.08	675	22.42	390		26.48	2540	28.42	690	28.50	4640	25.58	2450	23.29	945	21.94	402	20.56	96		19.81	46	19.79	46									
6	21.79	357		23.00	620	22.46	390		26.08	2240	23.39	690	27.73	4070	26.14	2870	23.40	1000	21.98	414	20.54	94		19.83	47	19.73	43									
7	21.83	369		22.83	590	22.52	405		25.71	1970	23.33	670	27.48	3880	25.54	2420	23.36	980	21.81	363	20.56	96		19.85	46	19.71	42									
8	21.87	381		22.71	550	22.58	411		25.56	1800	23.37	700	27.31	3750	25.75	2580	23.23	910	21.75	345	20.58	98		19.87	49	19.79	46									
9	21.77	351		22.62	510	22.60	450		25.21	1590	23.37	690	26.90	3440	25.67	2520	23.17	885	21.56	290	20.54	94		19.83	47	19.79	46									
10	21.71	333		22.83	530	22.62	453		24.98	1400	23.44	710	26.65	3260	25.64	2500	23.11	850	21.48	270	20.52	92		19.77	45	19.73	43									
11	21.69	327		22.94	520	22.69	459		24.87	1380	23.44	720	26.71	3300	24.60	1730	23.00	800	21.37	243	20.63	103		19.75	44	19.71	42									
12	21.69	327		22.92	510	22.71	483		24.77	1280	23.46	730	26.63	3240	24.04	1340	22.94	770	21.44	260	20.63	103		19.73	43	19.73	43									
13	21.71	333		22.83	497	22.71	480		24.67	1200	23.46	730	26.63	3240	23.92	1270	22.83	720	21.50	270	20.63	103		19.73	43	19.90	50									
14	21.58	294		22.79	480	22.73	480		24.52	1150	23.39	700	27.42	3840	24.06	1360	22.75	690	21.44	260	20.50	90		19.69	42	20.13	62									
15	22.62	306		22.75	450	22.75	480		24.37	1110	23.35	700	27.73	4070	23.98	1310	22.71	675	21.40	250	20.48	88		19.73	43	20.19	65									
16	22.62	306		22.77	450	22.75	480		24.37	1110	23.35	700	27.73	4070	23.98	1310	22.71	675	21.40	250	20.48	88		19.73	43	20.19	65									
17	21.58	294		22.75	450	22.71	480		24.25	1050	23.33	690	27.71	4050	24.17	1430	22.65	650	21.33	232	20.44	85		19.77	45	20.60	100									
18	21.50	270		22.81	420	22.81	510		24.17	1000	23.25	670	27.71	4050	24.14	1410	22.67	660	21.29	222	20.67	107		19.69	42	21.08	170									
19	21.44	255		22.60	420	22.81	510		24.14	980	23.21	600	27.54	3920	24.12	1390	22.50	595	21.25	212	20.98	147		19.69	42	21.87	381									
20	21.67	321		22.56	399	22.77	485		24.14	980	23.21	600	27.54	3920	24.12	1390	22.50	595	21.25	212	20.98	147		19.69	42	21.87	381									
21	21.96	408		22.56	390	22.81	510		23.08	950	23.17	590	27.59	3740	24.12	1390	22.42	565	21.08	170	20.87	130		19.71	42	22.90	755									
22	22.10	450		22.46	390	23.09	550		23.98	875	23.17	580	27.50	3900	23.90	1260	22.31	530	21.07	170	20.77	117		19.67	41	23.08	835									
23	22.21	483		22.48	390	23.79	900		23.87	840	23.25	580	27.87	4170	24.17	1430	22.25	505	21.08	170	20.61	104		19.75	44	22.96	780									
24	22.19	477		22.50	390	24.21	1100		23.71	775	23.23	630	27.87	4170	24.29	1510	22.15	470	21.06	165	20.48	88		19.75	44	22.67	665									
25	22.14	462		22.50	390	24.35	1230		23.67	775	23.21	670	27.63	3990	24.12	1390	22.12	463	21.02	156	20.42	83		19.73	43	22.50	590									
26	22.29	505		22.44	390	24.50	1320		23.67	780	23.29	710	27.42	3840	24.19	1440	22.04	432	21.00	150	20.36	77		19.75	44	22.46	585									
27	22.44	565		22.42	381	24.89	1520		23.69	790	23.48	925	27.15	3630	24.25	1480	21.98	414	21.02	155	20.25	69		19.79	46	22.42	560									
28	22.73	680		22.44	369	26.08	2170		23.71	800	24.12	1390	26.83	3390	24.25	1480	22.00	420	21.02	155	20.25	69		19.79	46	22.52	600									
29	22.92	760		22.46	366	26.50	2540		23.67	720	24.87	1920	26.40	3070	24.40	1590	21.98	414	21.06	165	19.87	47		19.87	49	22.52	605									
30	23.02	810		22.46	360	26.64	2720		.....	.....	26.32	3010	26.10	2840	24.67	1780	21.92	396	20.96	144	19.83	47		19.90	50	22.56	610							
31	.....	.....		22.46	369	26.56	2640		.....	.....	27.75	4080	.....	.....	24.73	1820	.....	.....	20.73	113	19.79	46		.....	.....	.....	.....					

Monthly Discharge of Black River near Washago for 1915-6

Drainage Area, 585 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November. (1915)	810	255	401	1.38	.44	.69	.77
December "	850	360	501	1.45	.62	.86	.99
January .. (1916)	2,720	360	837	4.65	.62	1.43	1.65
February	2,840	720	1,440	4.85	1.23	2.46	2.65
March	4,080	580	934	6.97	.99	1.60	1.84
April	4,930	2,840	3,882	8.43	4.85	6.64	7.41
May	2,870	1,260	1,840	4.91	2.15	3.15	3.63
June	1,660	396	740	2.84	.68	1.26	1.41
July	414	113	248	.71	.19	.42	.48
August	147	46	92	.25	.08	.16	.18
September	54	41	46	.09	.07	.08	.09
October	835	42	282	1.43	.07	.48	.55
The year	4,930	41	931	8.43	.07	1.59	21.64

Credit River at Cataract Junction

Location—About 500 feet from C.P.R. station at Cataract Junction, lot 14, concession 3, Township of Caledon, County of Peel.

Records Available—Discharge measurements from June, 1912, to October 31st, 1916. Daily gauge heights from May 7, 1915, to October 31, 1916.

Drainage Area—85 square miles.

Gauge—Vertical staff 0 to 6 feet on tree on right bank. Zero on gauge (elevation 8.00) is referred to a B.M. (elevation 10.00) painted on rock 100 feet downstream from metering section.

Channel and Control—The channel is straight for about 350 feet above and 300 feet below the section. The right bank is low, and overflows during high stages. The bed is composed of gravel, which is shifting during flood stages.

Discharge Measurements—Made at permanent wading section at all stages.

Winter Flow—The ice, unless jammed, has but little effect at this section. The open channel curve can be used with a fair degree of accuracy.

Regulation—The dam at Erin, about four miles upstream, causes serious fluctuations in the river stage at this section. Semi-daily gauge readings will not give a representative mean.

Accuracy—A fairly well-defined rating curve has been established for this station. The accuracy of the estimates of discharge depends upon the accuracy of the mean daily gauge heights.

Observer—Alfred Riches, Cataract Junction.

Discharge Measurements of Credit River at Cataract Junction in 1916

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916							
Jan. 7....	Roberts, E.	41	53	1.80	9.32	96 (a)	.....
" 27....	"	41	51	3.30	9.46	169 (b)	.....
Feb. 19....	"	45	55	1.06	9.25	58 (c)	.....

(a) Slush ice on control.

(b) Thin ice on river below section.

(c) Heavy ice; slush ice on control.

Daily Gauge Height and Discharge of Credit River at Cataract Junction for 1915-6

Drainage Area 85 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.	
	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.	Feet	Dis-charge Sec.-ft.
1	8.70	41	8.73	46	9.23	59	9.52	117	9.67	151	11.12	940	8.88	74	8.84	65	8.71	43	8.57	24	8.55	22	8.60	27
2	8.66	35	8.71	43	8.81	59	9.94	270	9.35	67	10.54	705	9.04	114	8.79	55	8.67	37	8.59	26	8.47	16	8.57	24
3	8.67	37	8.73	46	8.87	72	10.12	330	9.73	170	9.94	466	9.00	102	8.79	55	8.69	40	8.55	22	8.47	16	8.56	23
4	8.66	35	8.72	44	8.89	76	10.00	290	9.14	27	9.59	326	9.03	111	8.81	59	8.69	40	8.60	27	8.54	22	8.50	18
5	8.67	37	8.68	38	8.81	59	10.04	306	9.14	27	9.59	326	9.03	111	8.81	59	8.69	40	8.60	27	8.49	17	8.61	28
6	8.72	44	8.71	43	9.02	83	9.67	151	9.39	72	9.25	190	8.96	92	8.83	63	8.63	31	8.58	25	8.47	16	8.57	24
7	8.64	33	8.69	40	9.42	95	9.34	59	9.39	72	9.12	140	8.87	76	8.78	54	8.64	33	8.50	18	8.47	16	8.51	22
8	8.72	44	8.69	40	10.02	330	9.49	102	9.44	78	8.96	92	8.83	63	8.81	59	8.62	30	8.56	23	8.50	18	8.50	18
9	8.72	44	8.69	40	10.19	390	9.51	114	9.44	78	8.92	83	8.84	65	8.81	59	8.60	27	8.57	24	8.50	18	8.57	24
10	8.64	33	8.73	46	9.03	27	9.39	78	9.54	102	8.95	90	8.80	57	8.84	65	8.65	34	8.56	23	8.47	16	8.59	26
11	8.62	30	8.76	51	8.81	12	9.57	117	9.31	57	8.96	92	8.93	85	8.96	92	8.64	33	8.54	22	8.51	19	8.53	21
12	8.63	31	8.67	37	9.14	27	9.69	151	9.27	49	9.02	108	8.89	76	9.05	117	8.52	20	8.50	18	8.52	20	8.59	26
13	8.71	43	8.69	40	8.94	14	9.87	230	9.10	31	9.22	178	8.78	54	9.00	102	8.58	25	8.50	18	8.52	20	8.59	26
14	8.64	33	8.79	55	9.34	67	10.07	306	8.75	10	8.85	430	8.86	70	8.87	72	8.62	30	8.55	22	8.54	22	8.52	23
15	8.71	43	8.85	67	9.64	132	9.46	90	9.17	46	9.29	206	8.93	85	8.87	72	8.60	27	8.56	23	8.52	20	8.52	20
16	8.64	33	8.67	37	9.74	170	9.72	170	9.14	37	9.44	266	8.95	90	9.04	114	8.53	21	8.55	22	8.50	18	8.62	30
17	8.58	25	8.60	27	9.75	182	9.87	14	9.83	49	9.36	234	8.88	74	8.99	100	8.60	27	8.55	22	8.47	16	8.60	27
18	8.54	22	8.67	37	9.75	182	9.87	14	9.29	30	9.10	132	8.80	57	8.92	83	8.60	27	8.48	16	8.44	13	8.58	25
19	8.81	59	8.67	37	9.75	182	9.87	14	9.12	30	9.25	190	8.78	54	8.83	63	8.60	27	8.47	16	8.56	23	8.62	30
20	9.90	450	8.79	55	9.69	159	9.37	210	9.12	30	9.25	190	8.78	54	8.83	63	8.60	27	8.47	16	8.55	23	8.67	71
21	8.87	72	8.88	74	9.56	126	9.83	108	8.67	37	9.28	205	8.77	52	8.83	63	8.84	65	8.67	37	8.51	19	8.96	92
22	8.81	59	9.12	140	10.19	390	9.55	90	8.67	37	10.06	515	8.83	63	8.77	52	8.79	55	8.55	22	8.47	16	8.83	63
23	8.77	52	8.71	43	9.50	143	9.44	12	8.93	85	9.89	446	8.98	97	8.75	49	8.63	31	8.58	25	8.53	22	8.72	44
24	8.71	43	8.64	33	9.70	170	8.85	14	8.71	43	9.35	238	8.92	83	8.85	68	8.64	33	8.55	22	8.47	16	8.71	43
25	8.69	40	8.77	52	9.31	80	8.85	12	8.94	88	9.37	230	8.80	57	8.94	88	8.62	30	8.59	26	8.47	16	8.61	28
26	8.78	54	9.19	166	9.29	78	8.87	22	8.96	92	9.50	290	8.75	49	8.82	61	8.61	28	8.56	23	8.50	18	8.59	26
27	8.78	54	8.98	37	9.62	170	9.04	51	8.89	76	9.27	198	8.82	61	8.71	43	8.61	28	8.47	16	8.55	23	8.62	30
28	8.95	90	8.67	44	10.08	310	9.29	47	9.58	322	9.19	166	8.93	85	8.75	49	8.57	24	8.55	22	8.50	18	8.60	27
29	8.90	78	9.27	49	9.64	159	9.27	47	10.52	700	9.00	102	8.88	74	8.69	40	8.53	21	8.59	26	8.59	26	8.62	30
30	8.84	65	9.67	54	9.56	140	.....	.....	11.58	1120	8.96	92	9.06	120	8.71	43	8.53	21	8.56	23	8.58	25	8.73	46
31	.....	.....	9.74	54	10.58	470	.....	.....	11.29	1010	.....	.....	9.02	108	.....	.....	8.59	24	8.54	22	.....	.....	8.64	33

Monthly Discharge of Credit River at Cataract Junction for 1915-6

Drainage Area, 85 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	450	22	59	5.29	.26	.69	.77
December	166	27	52	1.95	.32	.61	.70
January .. (1916)	470	12	147	5.53	.14	1.73	1.99
February	330	12	131	3.88	.14	1.54	1.66
March	1,120	10	155	13.18	.12	1.82	2.10
April	940	83	266	11.06	.98	3.13	3.49
May	120	49	77	1.41	.58	.91	1.05
June	123	40	69	1.45	.47	.81	.90
July	43	20	31	.51	.24	.36	.42
August	37	16	22	.44	.19	.26	.30
September	26	13	19	.31	.15	.22	.25
October	92	18	32	1.08	.21	.38	.44
The year	1,120	10	88	13.18	.12	1.04	14.16

Maitland River at Ben Miller

Location—At the highway bridge in the Village of Ben Miller, five miles south-west of the Town of Goderich, Township of Colborne, County of Huron.

Records Available—Discharge measurements from May, 1911, to Feb., 1915. Daily gauge heights from June 1st, 1911, to Oct. 31st, 1916.

Drainage Area—950 square miles.

Gauge—Vertical steel staff gauge with enamelled face graduated in feet and inches and located on the downstream side of the first pier from the left abutment. The zero on the gauge (elev. 12.00) is referred to a bench mark (elev. 29.07) painted on the downstream side of the right wing wall.

Channel and Control—The channel is straight for 300 feet above and $\frac{1}{4}$ mile below the section. Both banks are low, clean and liable to overflow at high stages. The control is permanent during all stages, being composed of limestone.

Discharge Measurements—Made from the bridge at ordinary and high stages, and at a permanent wading section during the low water period.

Winter Flow—Ice greatly affects relation of gauge height to discharge. The section being wide and shallow, ice frequently freezes to the bottom, rendering meter measurements impossible.

Accuracy—For the low water a well-defined rating curve has been established.

Observer—E. Pfrimmer, Ben Miller P.O.

Daily Gauge Height and Discharge of Maitland River at Ben Miller for 1915-6

Drainage Area, 950 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	13.62	348	15.08	3060	14.83	1880	16.50	7850	14.00	780	17.25	11800	14.67	2050	14.33	1290	13.58	313	13.25	125	13.12	94	13.21	113
2	13.62	348	15.17	3300	15.00	2220	15.58	4510	14.25	1150	17.00	10300	14.67	2050	14.21	1090	13.58	313	13.25	125	13.12	94	13.17	104
3	13.62	348	15.33	3750	15.21	2550	15.25	3520	14.21	1090	16.33	7180	14.75	2220	14.08	890	13.54	279	13.21	113	13.08	87	13.12	94
4	13.62	348	15.17	3300	15.29	2800	14.83	2420	14.08	890	15.83	5340	14.92	2050	14.00	780	13.50	245	13.25	125	13.08	87	13.12	94
5	13.62	348	15.00	2850	17.25	6680	14.50	1640	14.00	780	15.54	4380	14.75	2220	14.25	1150	13.46	221	13.21	113	13.12	94	13.12	94
6	13.62	348	14.92	2650	16.67	5950	14.33	1290	14.00	780	15.25	3520	14.58	1830	14.33	1290	13.46	221	13.17	104	13.12	94	13.12	94
7	13.58	313	14.75	2220	16.17	4570	14.00	780	13.92	670	15.04	2950	14.58	1830	14.33	1290	13.42	197	13.17	104	13.12	94	13.12	94
8	13.58	313	14.50	1640	15.83	3950	14.25	780	13.83	555	14.83	2420	14.58	1830	14.25	1150	13.37	172	13.21	113	13.12	94	13.12	94
9	13.58	313	14.33	1290	15.25	2850	14.71	780	13.83	555	14.75	2220	14.67	2050	14.23	1120	13.37	172	13.19	108	13.12	94	13.12	94
10	13.58	313	14.21	1090	15.08	2800	14.50	890	13.79	510	14.67	2050	14.75	2220	14.33	1290	13.33	154	13.27	131	13.12	94	13.12	94
11	13.58	313	14.12	950	15.00	2680	14.33	1000	13.75	470	14.62	1930	14.92	2650	14.25	1150	13.33	154	13.21	113	13.12	94	13.12	94
12	13.58	313	14.04	735	14.92	2650	14.50	1070	13.83	555	14.58	1830	14.75	2220	14.25	1150	13.29	137	13.17	104	13.08	87	13.12	94
13	13.58	313	14.00	780	14.75	2220	14.75	1070	13.92	670	15.21	3410	14.48	1600	14.17	1020	13.33	154	13.17	104	13.08	87	13.33	154
14	13.56	296	13.96	725	14.67	2050	15.00	1070	13.92	670	15.50	4250	14.25	1150	14.08	890	13.33	154	13.17	104	13.04	83	13.29	137
15	13.56	296	13.96	725	14.58	1830	15.17	1070	13.79	510	16.00	5950	14.25	1150	14.08	890	13.33	154	13.17	104	13.04	83	13.25	125
16	13.56	296	13.96	725	14.50	1640	14.92	1070	13.96	725	16.33	7180	14.42	1460	14.08	890	13.33	154	13.12	94	13.04	83	13.29	137
17	13.54	279	14.21	1090	14.42	1460	14.50	1070	14.00	780	15.92	5660	14.50	1640	14.92	2650	13.25	125	13.10	90	13.08	87	13.37	172
18	13.58	313	14.42	1460	14.42	1460	14.17	1070	13.96	725	15.58	5660	14.50	1640	14.58	1830	13.33	154	13.08	87	13.08	87	13.37	172
19	14.00	780	14.37	1360	14.33	1290	14.04	835	13.92	670	15.25	3520	14.42	1640	14.50	1640	13.33	154	13.23	119	13.12	94	13.50	245
20	14.83	2420	14.37	1360	14.33	1290	14.29	1210	13.83	555	15.25	3520	14.42	1640	14.33	1290	13.33	154	13.19	108	13.12	94	13.50	245
21	14.92	2650	14.33	1290	16.37	7530	14.17	1020	13.83	555	15.25	3520	14.33	1290	14.29	1210	13.42	197	13.12	94	13.12	94	13.46	221
22	14.79	2320	14.33	1290	16.83	9340	14.12	950	13.79	510	15.42	4010	14.23	1120	14.17	1020	13.50	245	13.08	87	13.12	94	13.46	221
23	14.75	2220	14.46	1550	15.92	5660	14.21	1090	13.79	510	15.67	4800	14.23	1120	13.92	670	13.50	245	13.08	87	13.12	94	13.46	221
24	14.50	1640	14.54	1740	15.57	5070	14.08	890	13.75	470	15.83	3750	14.17	1020	13.83	555	13.42	197	13.04	81	13.14	98	13.46	221
25	14.42	1460	14.52	1690	15.83	5340	14.04	835	13.75	470	14.92	2650	14.12	950	13.79	510	13.35	162	13.08	87	13.14	98	13.42	197
26	14.58	1830	14.71	2120	15.83	5340	14.00	780	13.83	555	15.08	3060	14.08	890	13.67	393	13.35	162	13.12	94	13.14	98	13.42	197
27	14.83	2420	14.83	1830	15.92	5660	13.79	510	14.50	1640	15.25	3520	14.04	835	13.67	393	13.35	162	13.12	94	13.14	98	13.39	180
28	15.29	3630	14.92	1880	17.33	12280	13.71	430	15.00	4250	15.75	5070	13.96	725	13.62	348	13.33	154	13.12	94	13.21	113	13.39	180
29	15.42	4010	14.87	1880	16.33	7180	13.83	555	17.75	14800	15.08	3060	14.08	890	13.62	348	13.33	154	13.12	94	13.25	125	13.39	180
30	15.17	3300	14.83	1880	15.58	4510	.....	.....	19.33	29690	14.67	2050	14.25	1150	13.58	313	13.29	137	13.12	94	13.25	125	13.33	154
31	.....	.....	14.83	1880	16.00	5950	.....	.....	18.25	18620	.....	.....	14.42	1460	.....	.....	13.29	137	13.12	94	.....	.....	13.33	154

Monthly Discharge of Maitland River at Ben Miller for 1915-6

Drainage Area 950 Square Miles

Month	Discharge in Second-feet.			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	4,010	279	1,148	4.22	.29	1.21	1.35
December. "	3,750	725	1,745	3.95	.76	1.84	2.12
January ..(1916)	12,280	1,290	4,145	12.93	1.36	4.36	5.03
February	7,850	430	1,450	8.26	.45	1.53	1.65
March	29,690	470	2,779	31.25	.49	2.93	3.38
April	11,800	1,830	4,314	12.42	1.93	4.54	5.06
May	2,650	725	1,581	2.79	.76	1.66	1.91
June.....	2,650	313	1,017	2.79	.33	1.07	1.19
July	313	125	185	.33	.13	.19	.22
August	131	81	103	.14	.09	.11	.13
September	125	83	95	.13	.09	.10	.11
October	245	87	152	.26	.09	.16	.18
The year.....	29,690	81	1,559	31.25	.09	1.64	22.32

Nottawasaga River near Nicolston

Location—At McLean's Bridge, 4 miles north of the Town of Nicolston, near lot 5, concession 6, Township of Essa, County of Simcoe.

Records Available—Discharge measurements from June, 1912, to Feb., 1916. Daily gauge heights, from August 18, 1914, to October 31, 1916.

Drainage Area—416 square miles.

Gauge—Vertical staff 0 to 12 feet on right abutment, upstream side. Zero on the gauge (elevation 4.00) is referred to B.M. (elevation 20.00) on tension rod of bridge 60 feet from initial point for soundings.

Channel and Control—The channel below the section is straight for about 600 feet. Above the section it is straight for about 100 feet, when it takes a sharp turn to the right, causing an angle at the bridge. Both banks and control are subject to change under high-water conditions.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—The relation of gauge height to discharge is affected by ice during the winter months and measurements are made to compute the winter flow.

Regulation—The dams above have little effect this section.

Accuracy—These records, with the reduction made for the angle at section, can be considered good up to discharges of 800 second feet. There are not sufficient records available to compute discharges very accurately above gauge height 8.00 feet. The estimate made is probably close to the actual discharge.

Observer—John Scott, Egbert P.O.

Discharge Measurements of Nottawasaga River near Nicolston in 1916

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1916							
Jan. 15....	Cunnington, G...	90	378	1.24	7.67	468 (a)	.....
Feb. 12....	Roberts, E.....	90	264	.89	6.46	236 (a)	.....
" 23....	Cunnington, G...	90	264	.84	6.42	224 (a)	.....

(a) Ice measurement.

Drainage Area 416 Square Miles

[illegible]

Monthly Discharge of Nottawasaga River near Nicolston for 1915-6

Drainage Area 416 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	447	164	245	1.07	.39	.59	.66
December “	306	164	228	.74	.39	.55	.63
January. (1916)	1,680	244	677	4.04	.59	1.63	1.88
February	2,720	196	438	6.54	.47	1.05	1.13
March	5,130	220	722	12.33	.53	1.74	2.01
April	4,390	535	1,450	10.55	1.29	3.49	3.89
May	1,190	228	456	2.86	.55	1.10	1.27
June	740	168	384	1.78	.40	.92	1.03
July	164	61	111	.39	.15	.27	.31
August	140	48	68	.34	.12	.16	.18
September	121	50	75	.29	.12	.18	.20
October	402	65	143	1.97	.16	.34	.39
The year	5,130	48	415	12.33	.12	1.00	13.61

Rocky Saugeen River near Markdale

Location—At the Glen Cross highway bridge, three-quarters of a mile above Hayward's Falls, near lot 5, concession 8, Township of Glenelg, County of Grey.

Records Available—Discharge measurements and daily gauge heights June 8, 1915, to October 31, 1916.

Drainage Area—96 square miles.

Gauge—Vertical staff 0 to 6 feet on the downstream side of the centre pier of bridge. The zero of gauge (elevation 0.00) is referred to a B.M. (elevation 29.65) painted on a rock projecting from bank 40 feet north from first telephone pole on left bank.

Channel and Control—The channel is straight for 200 feet above and 500 feet below the station. The bed and banks are permanent, as flood conditions do not exist on this stream.

Discharge Measurements—Made at a permanent wading section. When the river is extremely high measurements will be made from the bridge.

Winter Flow—Ice does have a serious effect at this section.

Regulation—The dam above has little effect on the river stage at this section.

Accuracy—The rating curve is well defined except for maximum flows.

Observer—Arthur McNally, Markdale.

Discharge Measurements of Rocky Saugeen River near Markdale in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Dec. 9....	Cunnington, G..	75	75	1.04	1.37	78 (a)	.....
1916							
Jan. 13....	"	85	150	1.48	2.25	223 (b)	.....
Feb. 10....	Roberts, E.	85	158	1.38	2.25	218	.....
" 24....	Cunnington, G..	82	125	1.08	1.83	138	.....
June 12....	Roberts, E.	85	128	1.18	1.92	150	.....
Oct. 4....	"	68	61	.83	1.14	50	.....

(a) Logs in stream.

(b) Ice measurement.

Daily Gauge Height and Discharge of Rocky Saugeen River near Markdale for 1915-6
Drainage Area, 96 Square Miles

Date	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.	Gauge Ht.	Dis- charge Sec.-ft.
1	1.25	58	1.75	123	1.67	111	2.58	291	1.92	115	3.50	520	2.33	234	2.08	181	1.75	122	1.33	67	1.25	59	1.17	53
2	1.33	67	1.75	123	1.75	123	2.67	313	1.83	101	3.42	500	2.50	273	1.92	151	1.75	122	1.33	67	1.25	59	1.17	53
3	1.33	67	1.75	123	1.75	123	2.75	332	1.83	101	3.25	457	2.50	273	1.92	151	1.67	111	1.33	67	1.25	59	1.17	53
4	1.33	67	1.67	111	1.67	111	2.67	313	1.83	101	3.25	457	2.50	273	1.92	151	1.67	111	1.33	67	1.25	59	1.17	53
5	1.33	67	1.58	98	1.67	111	2.58	291	1.75	91	3.00	395	2.42	255	1.92	151	1.67	111	1.33	67	1.25	59	1.17	53
6	1.25	58	1.58	98	1.75	123	2.50	273	1.75	91	2.83	353	2.42	255	1.92	151	1.58	98	1.33	67	1.25	59	1.17	53
7	1.25	58	1.50	88	1.75	123	2.50	273	1.75	91	2.67	313	2.33	234	1.92	151	1.58	98	1.33	67	1.25	59	1.17	53
8	1.25	58	1.42	78	1.67	111	2.50	273	1.67	81	2.58	291	2.25	216	1.92	151	1.58	98	1.33	67	1.25	59	1.17	53
9	1.25	58	1.42	78	1.67	111	2.50	273	1.67	81	2.58	291	2.25	216	1.92	151	1.50	88	1.33	67	1.25	59	1.17	53
10	1.25	58	1.42	78	1.75	123	2.25	216	1.67	81	2.50	273	2.17	200	2.00	165	1.50	88	1.33	67	1.25	59	1.17	53
11	1.25	58	1.42	78	1.75	123	2.33	234	1.67	81	2.58	291	2.17	200	2.00	165	1.50	88	1.33	67	1.25	59	1.17	53
12	1.25	58	1.42	78	1.83	135	2.33	234	1.67	81	2.58	291	2.17	200	2.00	165	1.50	88	1.33	67	1.25	59	1.17	53
13	1.25	58	1.42	78	1.92	151	2.67	313	1.67	81	2.67	313	2.17	200	1.92	151	1.50	88	1.25	59	1.25	59	1.17	53
14	1.25	58	1.42	78	2.33	234	2.67	313	1.67	81	2.75	332	2.00	165	1.92	151	1.50	88	1.25	59	1.25	59	1.17	53
15	1.25	58	1.50	88	2.00	165	2.67	313	1.58	70	2.92	375	2.17	200	2.00	165	1.50	88	1.25	59	1.25	59	1.17	53
16	1.25	58	1.50	88	1.83	135	2.58	239	1.67	81	2.83	353	2.17	200	2.25	216	1.50	88	1.25	59	1.25	59	1.17	53
17	1.25	58	1.50	88	1.92	151	2.58	239	1.67	81	2.83	353	2.08	181	2.50	273	1.50	88	1.25	59	1.08	47	1.25	59
18	1.33	67	1.58	98	1.92	151	2.50	216	1.67	81	2.75	332	2.08	181	2.33	234	1.42	78	1.25	59	1.08	47	1.25	59
19	1.50	88	1.67	111	2.00	165	2.42	200	1.58	69	2.67	313	2.08	181	2.25	216	1.42	78	1.25	59	1.08	47	1.33	67
20	1.58	98	1.67	111	2.08	181	2.33	185	1.58	69	2.75	332	2.08	181	2.17	200	1.42	78	1.25	59	1.08	47	1.33	67
21	1.58	98	1.58	98	2.83	353	2.33	185	1.58	69	2.75	332	2.00	165	2.00	165	1.50	88	1.25	59	1.17	53	1.42	78
22	1.50	88	1.58	98	2.83	353	2.25	171	1.67	111	3.08	415	2.00	165	1.92	151	1.50	88	1.17	53	1.25	59	1.42	78
23	1.42	78	1.50	88	2.83	353	2.25	171	1.75	123	2.92	375	2.00	165	1.83	135	1.50	88	1.17	53	1.25	59	1.33	67
24	1.42	78	1.58	98	2.83	353	2.08	138	1.75	123	2.83	353	2.00	165	1.83	135	1.42	78	1.17	53	1.25	59	1.33	67
25	1.50	88	1.50	88	2.75	332	2.08	138	1.75	123	2.83	353	1.92	151	1.83	135	1.42	78	1.17	53	1.25	59	1.33	67
26	1.67	111	1.58	98	2.67	313	2.08	138	1.75	123	2.67	313	1.92	151	1.83	135	1.33	67	1.25	59	1.25	59	1.25	59
27	1.75	123	1.67	111	2.67	313	2.08	138	1.83	135	2.50	273	1.92	151	1.83	135	1.33	67	1.25	59	1.25	59	1.25	59
28	1.75	123	1.58	98	2.92	375	2.00	125	2.00	165	2.50	273	2.00	165	1.83	135	1.33	67	1.25	59	1.25	59	1.25	59
29	1.75	123	1.58	98	2.92	375	1.92	115	2.42	255	2.42	255	2.08	181	1.83	135	1.33	67	1.25	59	1.25	59	1.25	59
30	1.75	123	1.58	98	2.75	332	1.92	115	2.67	313	2.33	234	2.08	181	1.83	135	1.33	67	1.25	59	1.25	59	1.25	59
31	.....	.....	1.58	98	2.58	291	.....	.....	3.17	438	.....	.....	2.08	181	.....	.....	1.33	67	1.25	59	.....	.....	1.25	59

Monthly Discharge of Rocky Saugeen River near Markdale for 1915-6

Drainage Area, 96 Square Miles

Month.	Discharge in Second-feet.			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915).	123	58	77	1.28	.60	.80	.89
December ..	123	78	96	1.28	.81	1.00	1.15
January (1916).	375	111	208	3.91	1.16	2.17	2.50
February	332	115	226	3.46	1.20	2.35	2.53
March	438	69	119	4.56	.72	1.24	1.43
April	520	234	344	5.42	2.44	3.58	3.99
May	273	151	198	2.84	1.57	2.06	2.37
June	273	135	162	2.84	1.41	1.69	1.89
July	122	67	88	1.27	.70	.92	1.06
August	78	53	62	.81	.55	.65	.75
September ,....	67	47	58	.70	.49	.60	.67
October	78	53	59	.81	.55	.61	.70
The year.....	520	47	141	5.42	.49	1.47	20.01

Saugeen River near Port Elgin

Location—At the highway bridge known at McCaLder's Bridge, 4 miles north-east of the Town of Port Elgin, near lot 5, concession 12, Township of Saugeen, County of Bruce.

Records Available—Discharge measurements from July, 1911, to October, 1916. Daily gauge heights from April 19, 1914, to October 31, 1916.

Drainage Area—1,565 square miles.

Gauge—Vertical staff 0 to 12 feet on right abutment downstream side. Zero on gauge (elevation 4.00) is referred to a B.M. (elevation 25.00) painted on wooden hand-rail of bridge.

Channel and Control—The channel is straight for about 350 feet above and below the section. The bed of the stream, with two submerged piers at the section, is composed of fairly large boulders, which will only shift during high flood stages. The current is moderate and flows through two channels, which are separated by the centre pier of the bridge.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—Ice greatly affects relation of gauge height to discharge. Measurements are made during the winter to determine the flow.

Regulation—Fluctuations occur in the river stage at this section. This is no doubt caused by the plants at Walkerton, Chesley and Paisley.

Accuracy—Semi-daily reading should give a fair representative mean. The fluctuations that have been noted are not large, consequently the gauge height records can be classified as good. A well-defined curve is shown for flows up to 20,000 sec. feet. A slight angle in cross-section No. 1 may affect accuracy of meter measurements.

Observer—John Shanks, Southampton.

Discharge measurements of Saugeen River near Port Elgin in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 23....	Yeates, W.	197	1,060	1.81	6.80	1,922	.....
1916							
Jan. 12....	Cunnington, G. ...	210	1,439	2.41	8.67	3,462 (a)	.....
" 28....	Yeates, W.	210	2,431	4.59	13.33	11,166 (b)	.....
" 28....	"	210	2,410	4.59	13.26	11,070 (b)	.....
" 28....	"	210	2,389	4.50	13.17	10,762 (b)	.....
Feb. 2....	"	210	1,696	3.68	9.88	6,234 (c)	.....
" 2....	"	210	1,675	3.64	9.79	6,095 (c)	.....
Mar. 30....	Roberts, E.	210	2,578	6.45	14.03	16,637 (c)	.....
" 30....	"	210	2,557	6.45	13.96	16,488 (c)	.....
" 31....	"	210	2,431	5.96	13.31	14,477 (c)	.....
" 31....	"	210	2,431	6.01	13.31	14,600 (c)	.....
" 31....	"	210	2,578	6.44	14.00	16,576 (c)	.....
Apr. 2....	Yeates, W.	220	2,765	6.73	14.75	18,605 (c)	.....
" 2....	"	220	2,699	6.62	14.48	17,880 (c)	.....
" 3....	"	210	2,452	6.02	13.45	14,768 (c)	.....
" 4....	Roberts, E.	210	2,305	5.45	12.75	12,556 (c)	.....
" 4....	"	210	2,284	5.42	12.69	12,374 (c)	.....
" 4....	"	210	2,242	5.22	12.49	11,694 (c)	.....
" 4....	"	210	2,242	5.11	12.44	11,458 (c)	.....
" 4....	"	210	2,221	5.14	12.39	11,423 (c)	.....
" 5....	"	210	2,116	4.90	11.88	10,369 (c)	.....
" 5....	"	210	2,074	4.66	11.66	9,652 (c)	.....
" 5....	"	210	2,074	4.61	11.61	9,562 (c)	.....
" 6....	"	210	1,927	4.25	10.96	8,185 (c)	.....
" 7....	"	210	1,759	3.77	10.18	6,625 (c)	.....
" 7....	"	210	1,811	3.82	10.40	6,922 (c)	.....
" 8....	"	210	1,654	3.49	9.68	5,770 (c)	.....
" 11....	Yeates, W.	210	1,381	2.79	8.33	3,852 (c)	.....
" 11....	"	210	1,381	2.76	8.33	3,803 (c)	.....
" 12....	"	210	1,444	2.84	8.67	4,103 (c)	.....
" 12....	"	210	1,444	2.92	8.67	4,216 (c)	.....
" 12....	"	210	1,444	2.95	8.69	4,266 (c)	.....
" 12....	"	210	1,444	2.89	8.69	4,176 (c)	.....
" 13....	"	210	1,538	3.19	9.19	4,905 (c)	.....
" 13....	"	210	1,538	3.21	9.19	4,940 (c)	.....
Oct. 5....	"	191	673	.65	4.79	436	.....

(a) Too many estimated velocities for accurate results.

(b) Ice and slush in stream; co-efficient applied to observed surface velocities.

(c) Co-efficient applied to observed surface velocities.

Monthly Discharge of Saugeen River near Port Elgin for 1915-6

Drainage Area, 1,565 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November(1915).	3,950	645	1,400	2.53	.41	.90	1.00
December ..	3,195	955	1,900	2.05	.61	1.22	1.40
January ((1916).	13,400	1,730	5,089	8.59	1.11	3.26	3.76
February	8,485	2,810	4,890	5.44	1.80	3.13	3.37
March.....	17,455	2,280	4,213	11.19	1.46	2.70	3.11
April.....	19,345	3,220	7,702	12.40	2.06	4.94	5.51
May	4,140	2,000	2,716	2.65	1.28	1.74	2.01
June	5,330	1,320	1,984	3.42	.85	1.27	1.42
July.....	1,220	475	683	.78	.30	.44	.51
August	550	415	446	.35	.27	.29	.33
September.....	510	355	405	.33	.23	.26	.29
October.....	850	355	593	.54	.23	.38	.44
The year	19,345	355	2,654	12.40	.23	1.70	23.14

Saugeen River near Walkerton

Location—At the south line bridge, 3½ miles above the Town of Walkerton, near lot 39, concession 2, Township of Brant, County of Bruce.

Records Available—Discharge measurements from June, 1912, to October, 1916. Daily gauge heights from March 26, 1914, to October 31, 1916.

Drainage Area—895 square miles.

Gauge—Vertical staff 0 to 12 feet on post driven in bed of stream and protected by overhanging tree on right bank 100 feet downstream from bridge. Zero on the gauge is 12.00 feet, which is referred to a B.M. (elevation 35.00) on tension rod of bridge.

Channel and Control—Channel is straight for about 500 feet above and below the section. Both banks are high, and do not overflow. The river bed is composed of clay, one channel existing at all stages.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—Ice greatly affects relation of gauge height to discharge. Measurements are made to determine the winter flow.

Regulation—The dam at Walkerton, about 3½ miles downstream, has no effect on the river stage at this section.

Accuracy—Weeds below the section have a decided effect on the accuracy of the measurements. During the period when weeds are present, a different rating curve has been established. There are not sufficient records available to define the two curves at all stages, and therefore discharges cannot be classed as very good.

Observer—James Preston, Walkerton.

Discharge Measurements of Saugeen River near Walkerton in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 24....	Yeates, W.	126	598	1.47	16.52	884	.....
1916							
Jan. 29....	“	135	1,485	3.66	23.04	5,439 (a)	.....
April 3....	“	135	1,566	4.86	23.60	7,605	.....
June 13....	Roberts, E.....	125	621	1.61	16.68	1,001	.....
Oct. 4....	Yeates, W.	119	436	.54	15.08	234	.....

(a) Heavy slush in river.

Daily Gauge Height and Discharge of Saugeen River near Walkerton for 1915-6

Drainage Area, 850 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge			
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.				
1	15.50	385	17.79	1.810	16.17	685	21.04	3,700	16.37	600	.....	6,480	17.79	1,810	16.98	1,190	770	15.37	288	15.17	261	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246
2	15.54	400	17.42	1.495	16.92	1,145	19.58	3,250	16.35	600	.....	7,040	18.25	2,250	16.71	995	620	15.33	312	15.25	285	15.25	297	15.25	297	15.25	297	15.25	297	15.25	297	15.25	297	15.25	297
3	15.62	435	17.12	1.285	17.25	1,375	18.42	2,420	16.29	600	23.60	7,600	18.58	2,580	16.62	940	580	15.33	312	15.25	285	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	
4	15.67	455	16.83	1,080	17.35	1,735	17.37	1,460	16.29	600	22.00	6,000	18.96	2,960	16.50	870	525	15.29	297	15.17	261	15.17	261	15.17	261	15.17	261	15.17	261	15.17	261	15.17	261	15.17	261	
5	15.75	490	16.62	940	17.87	1,560	17.42	1,495	16.29	600	21.50	5,500	18.71	2,710	16.67	970	540	15.21	273	15.14	252	15.14	252	15.14	252	15.14	252	15.14	252	15.14	252	15.14	252	15.14	252	
6	15.71	470	16.50	870	18.29	1,640	17.67	1,705	16.29	600	20.75	4,750	18.29	2,290	16.54	895	577	15.29	297	15.11	246	15.11	246	15.11	246	15.11	246	15.11	246	15.11	246	15.11	246	15.11	246	
7	15.58	415	16.42	820	18.33	1,730	17.46	1,530	16.25	575	19.75	3,750	17.87	1,880	16.48	860	577	15.25	285	14.96	198	15.21	273	15.21	273	15.21	273	15.21	273	15.21	273	15.21	273	15.21	273	
8	15.67	455	16.42	820	18.37	1,805	17.37	1,460	16.33	575	19.12	3,120	17.71	1,740	16.37	790	551	15.54	396	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	
9	15.58	415	16.29	745	18.67	2,000	17.75	1,560	16.37	575	18.58	2,580	17.69	1,720	16.50	870	551	15.54	396	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	
10	15.60	425	16.00	600	18.58	1,910	18.42	1,640	16.29	625	18.29	2,290	17.54	1,590	16.29	745	558	15.58	412	15.50	380	14.92	186	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	
11	15.46	370	16.04	620	18.21	1,775	18.17	1,730	16.42	700	18.29	2,290	17.71	1,810	17.04	1,230	558	15.58	396	15.37	328	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	
12	15.50	385	16.00	600	18.04	1,560	18.02	1,560	16.46	700	18.83	2,830	17.71	1,740	16.92	1,140	558	15.58	396	15.33	312	15.00	210	15.04	222	15.00	210	15.04	222	15.00	210	15.04	222	15.00	210	
13	15.58	415	16.08	640	18.25	1,640	17.69	1,270	16.50	700	19.71	3,710	17.46	1,530	16.71	995	558	15.58	396	15.33	312	15.00	210	15.04	222	15.00	210	15.04	222	15.00	210	15.04	222	15.00	210	
14	15.33	325	16.02	610	18.12	1,600	17.69	1,200	16.50	700	21.21	5,210	17.04	1,230	16.46	845	558	15.54	396	15.29	297	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	
15	15.54	400	15.96	580	18.00	1,520	17.79	1,200	16.33	650	22.58	6,580	17.35	1,440	16.46	845	558	15.54	396	15.29	297	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	
16	15.46	370	16.08	640	18.00	1,410	17.79	1,130	16.37	650	21.46	5,460	17.04	1,230	16.46	845	558	15.54	396	15.29	297	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	
17	15.46	370	16.14	670	17.52	1,060	17.42	1,095	16.37	650	20.58	4,580	17.42	1,500	19.50	3,500	558	15.46	364	15.17	261	14.83	159	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	
18	15.46	370	16.12	660	17.42	990	17.08	930	16.37	650	20.60	4,600	17.64	1,680	19.62	3,620	558	15.46	364	15.17	261	14.83	159	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	
19	15.83	525	16.25	725	17.50	990	16.75	725	16.35	675	20.33	4,330	17.64	1,680	19.62	3,620	558	15.46	364	15.17	261	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	15.04	222	
20	16.71	1,000	16.21	705	17.29	1,060	16.62	650	16.29	675	20.42	4,420	17.37	1,460	18.08	2,080	558	15.46	364	15.12	246	15.08	234	15.71	470	15.08	234	15.08	234	15.71	470	15.08	234			
21	17.12	1,285	16.31	755	17.08	1,200	16.71	750	16.29	675	20.42	4,420	17.37	1,460	18.08	2,080	558	15.46	364	15.12	246	15.08	234	15.71	470	15.08	234	15.08	234	15.71	470	15.08	234			
22	17.00	1,200	16.42	820	20.53	4,000	16.83	810	16.33	675	21.21	5,210	17.00	1,260	16.87	1,160	600	15.21	273	15.08	234	15.71	470	15.08	234	15.08	234	15.71	470	15.08	234	15.71	470			
23	16.58	920	16.42	820	20.92	4,400	16.77	750	16.21	675	22.62	6,620	17.08	1,260	16.79	1,050	558	15.46	364	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246			
24	16.52	880	16.29	745	20.71	4,200	16.67	700	16.17	685	21.67	5,670	17.04	1,230	16.50	870	558	15.46	364	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246			
25	16.46	845	16.21	705	20.56	4,100	16.46	700	16.38	770	20.42	4,420	17.00	1,260	16.79	1,050	558	15.46	364	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246			
26	16.62	940	16.25	725	20.60	4,100	16.46	700	16.58	920	19.42	3,420	16.67	970	16.25	725	558	15.46	364	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246			
27	17.50	1,560	16.33	770	21.23	4,650	16.46	700	17.83	1,850	19.21	3,210	16.71	995	16.37	790	558	15.46	364	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246			
28	18.35	2,350	16.25	725	23.75	6,200	16.37	650	20.25	4,250	18.75	2,750	17.21	1,350	16.42	820	558	15.46	364	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246			
29	18.58	2,580	16.29	745	22.79	5,450	16.37	600	.....	4,800	18.33	2,330	17.58	1,620	16.33	770	558	15.46	364	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246		
30	18.46	2,460	16.42	820	21.17	4,500	.....	.....	.....	5,360	17.92	1,930	17.42	1,500	16.25	725	558	15.46	364	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246	15.12	246		
31	.....	.....	.....	840	20.83	4,200	.....	.....	.....	5,920	.....	.....	17.17	1,320	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Monthly Discharge of Saugeen River near Walkerton for 1915-6

Drainage Area 850 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	2,580	325	796	3.04	.38	.94	1.05
December "	1,810	580	819	2.13	.68	.96	1.11
January .. (1916)	6,200	685	2,448	7.29	.81	2.88	3.32
February	3,700	600	1,313	4.35	.71	1.54	1.66
March	5,920	577	1,267	6.96	.68	1.49	1.72
April	7,600	1,930	4,443	8.94	2.27	5.23	5.84
May.....	2,960	970	1,631	3.48	1.14	1.92	2.21
June.....	3,620	725	1,235	4.26	.85	1.45	1.62
July.....	770	297	437	.91	.35	.51	.59
August.....	396	210	278	.47	.25	.33	.38
September.....	366	159	244	.43	.19	.29	.32
October	505	222	328	.59	.26	.39	.45
The year	7,600	159	1,268	8.94	.19	1.49	20.28

Sydenham near Owen Sound

Location—At the highway bridge above the Town of Owen Sound's filtration plant, near lot 9, concession 1, Township of Derby, County of Grey.

Records Available—Discharge measurements and daily gauge heights from June 9, 1915, to October 31, 1916.

Drainage Area—71 square miles.

Gauge—Vertical staff 0 to 6 feet on upstream side of first pier from right abutment. Zero on the gauge is 0.00.

Channel and Control—The channel is straight for 200 feet above and below the section, both banks are low, but do not overflow, the stream never assuming flood proportions. The bed is composed of solid rock, with two channels during the low-water period. During the high-water stages all the water is confined between the two abutments of the bridge.

Discharge Measurements—Made from the bridge during the high-water period, and from a permanent wading section located 30 feet upstream during the low stages.

Winter Flow—Ice has little effect.

Regulation—The Town of Owen Sound has a dam 300 feet above this section that is used to supply water for the filtration beds.

Diversions—An additional 750,000 gallons of water per day should be added to the daily flow at this section, which is the approximate amount diverted.

Accuracy—There are not sufficient readings to define a curve at all stages. Discharges between gauge heights .90 and 1.40 are fair.

Observer—Myrtle Cook, Ashley P.O.

Discharge Measurements of Sydenham River near Owen Sound in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Dec. 9....	Cunnington, G..	52	39	1.76	1.33	67	.....
1916							
June 12....	Roberts, E....	60	47	1.73	1.42	81	.....
Oct. 4....	Yeates, W....	46	19	.91	.92	18	.....

Daily Gauge Height and Discharge of Sydenham River near Owen Sound for 1915-6

Drainage Area, 71 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.	Gauge Ht.	Dis-charge	Sec.-ft.			
1	1.06	33	1.64	130	43	2.25	278	61	3.02	576	152	1.75	1.69	140	77	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19	
2	1.06	33	1.62	126	1.54	71	2.10	234	1.69	61	3.00	568	1.79	160	1.60	122	1.33	71	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19		
3	1.08	35	1.50	102	1.71	112	2.04	217	1.83	74	2.71	448	1.87	177	1.54	110	1.29	64	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19		
4	1.10	37	1.46	94	1.79	122	1.94	193	1.79	69	2.54	380	1.92	188	1.50	102	1.25	58	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22		
5	1.17	46	1.42	86	2.10	184	1.83	169	1.83	74	2.37	318	1.85	173	1.50	102	1.25	58	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22		
6	1.17	46	1.42	86	2.19	220	1.81	112	1.71	58	2.19	259	1.79	160	1.46	94	1.25	58	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22		
7	1.17	46	1.37	77	2.23	234	2.06	132	1.73	63	2.06	223	1.75	152	1.39	80	1.21	52	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22		
8	1.12	40	1.33	71	2.08	206	2.00	128	1.85	66	2.00	206	1.71	144	1.33	71	1.17	46	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19		
9	1.08	35	1.29	64	1.96	173	1.83	116	1.87	68	1.89	182	1.71	144	1.33	71	1.17	46	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19	0.96	22	0.92	19		
10	1.08	35	1.37	61	1.87	152	1.75	102	1.87	71	1.83	169	1.67	136	1.44	90	1.12	40	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19		
11	1.06	33	1.33	56	1.89	156	1.71	88	2.08	86	1.87	177	1.67	136	1.42	84	1.12	40	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19		
12	1.08	35	1.37	50	1.85	142	1.69	77	1.98	74	1.98	202	1.67	136	1.42	84	1.12	40	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19		
13	1.08	35	1.33	43	1.88	138	1.66	70	1.98	74	1.98	202	1.67	136	1.42	84	1.12	40	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19		
14	1.08	35	1.29	45	2.01	184	1.85	82	1.85	61	2.12	240	1.58	118	1.29	64	1.08	35	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19		
15	1.08	35	1.31	42	1.94	162	1.64	66	1.87	61	2.27	284	1.56	114	1.37	77	1.08	35	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19		
16	1.08	35	1.25	37	1.83	146	1.62	63	2.00	74	2.12	240	1.54	110	1.87	177	1.08	35	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19		
17	1.08	35	1.27	37	1.96	162	1.62	61	1.92	66	2.00	206	1.58	118	2.42	335	1.04	30	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19	1.00	26	0.92	19		
18	1.06	33	1.33	43	1.89	152	1.64	61	2.08	74	2.00	206	1.58	118	2.58	394	1.00	26	0.96	22	0.92	19	1.04	30	0.96	22	0.92	19	1.04	30	0.96	22	0.92	19		
19	1.21	52	1.81	43	1.81	144	1.79	71	2.17	90	2.00	206	1.58	118	2.33	304	1.00	26	0.96	22	0.92	19	1.04	30	0.96	22	0.92	19	1.04	30	0.96	22	0.92	19		
20	1.40	82	1.29	37	1.73	132	1.67	58	2.17	86	1.98	202	1.58	118	2.08	228	1.00	26	0.96	22	0.92	19	1.04	30	0.96	22	0.92	19	1.04	30	0.96	22	0.92	19		
21	1.54	110	1.33	41	1.69	140	1.79	69	2.00	79	2.06	223	1.54	110	1.92	188	1.04	30	0.96	22	0.92	19	1.04	30	0.96	22	0.92	19	1.04	30	0.96	22	0.92	19		
22	1.58	118	1.33	41	2.35	311	1.62	58	2.12	112	2.35	311	1.50	102	1.67	136	1.08	35	1.00	26	0.92	19	1.04	30	0.96	22	0.92	19	1.04	30	0.96	22	0.92	19		
23	1.58	118	1.33	41	2.79	484	1.62	58	2.12	112	2.35	311	1.50	102	1.67	136	1.08	35	1.00	26	0.92	19	1.04	30	0.96	22	0.92	19	1.04	30	0.96	22	0.92	19		
24	1.58	118	1.37	46	2.62	412	1.58	49	2.12	118	2.23	272	1.50	102	1.62	126	1.04	30	0.92	19	0.92	19	1.04	30	0.92	19	0.92	19	1.04	30	0.92	19	0.92	19		
25	1.44	90	1.33	41	2.39	325	1.58	49	1.87	106	2.04	217	1.46	94	1.54	170	1.00	26	0.96	22	0.92	19	1.00	26	0.96	22	0.92	19	1.00	26	0.96	22	0.92	19		
26	1.42	86	1.35	43	2.39	325	1.58	49	1.79	142	1.94	193	1.42	86	1.50	102	1.00	26	0.96	22	0.92	19	1.00	26	0.96	22	0.92	19	1.00	26	0.96	22	0.92	19		
27	1.44	90	1.39	43	2.46	350	1.62	56	1.89	182	1.85	173	1.42	86	1.50	102	1.00	26	0.96	22	0.92	19	1.00	26	0.96	22	0.92	19	1.00	26	0.96	22	0.92	19		
28	1.52	106	1.42	43	2.73	456	1.71	61	2.12	240	1.81	164	1.71	144	1.50	102	1.00	26	0.96	22	0.92	19	1.00	26	0.96	22	0.92	19	1.00	26	0.96	22	0.92	19		
29	1.58	118	1.42	43	2.48	357	1.62	56	2.46	350	1.75	152	1.92	188	1.50	102	1.00	26	0.96	22	0.92	19	1.00	26	0.96	22	0.92	19	1.00	26	0.96	22	0.92	19		
30	1.62	126	1.42	43	2.25	278	.....	.....	2.83	500	1.75	152	1.83	169	1.42	86	0.96	22	0.92	19	1.00	26	1.00	26	0.92	19	1.00	26	1.00	26	0.92	19	1.00	26
31	.....	.....	1.37	43	2.23	272	.....	.....	2.92	536	.....	.....	1.77	156	.....	.....	1.00	26	0.92	19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Monthly Discharge of Sydenham River near Owen Sound for 1915-6

Drainage Area 71 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November. (1915)	126	33	62	1.77	.46	.87	.97
December ..	130	37	58	1.83	.52	.82	.95
January .. (1916)	484	43	219	6.82	.61	3.08	3.55
February	278	49	100	3.92	.69	1.41	1.52
March	536	58	124	7.55	.82	1.75	2.02
April	576	152	254	8.11	2.14	3.58	3.99
May	188	86	134	2.65	1.21	1.89	2.18
June	394	64	134	5.55	.90	1.89	2.11
July	77	22	39	1.08	.31	.55	.63
August	26	19	23	.37	.27	.32	.37
September	26	15	19	.37	.21	.27	.30
October	46	15	27	.65	.21	.38	.44
The year	576	15	99	8.11	.21	1.39	18.92

Thames River (Main Stream) near Byron

Location—At the highway bridge known as Kilworth Bridge, 2 miles north-west of the Town of Byron, near the Village of Komoka, Township of Delaware, County of Middlesex.

Records Available—Monthly discharge measurements from March, 1912, to August, 1916. Daily gauge heights from March 13, 1914, to October 31, 1916.

Drainage Area—1,270 square miles.

Gauge—Vertical staff 0 to 12 feet on centre pier. The zero on gauge (elevation 6.00), which has remained unchanged since established, is referred to a B.M. (elevation. 31.21) on downstream side of right abutment.

Channel and Control—The channel is straight above and below section for about 600 feet. The banks are high, and do not overflow or shift to a great extent. The control, however, is not stationary under high-water conditions. The velocity is high.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—Ice is present during the winter period, and measurements are made to determine the winter flow.

Accuracy—During flood stages the high velocity necessitates the taking of surface readings. The station rating curve is fairly well defined for ordinary flows.

Observer—James Bourne, Komoka.

Discharge Measurements of Thames River (main stream) near Byron
in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915 Nov. 12....	Yeates, W.	197	229	1.34	6.63	319	.....
1916 Jan. 25....	“	239	964	4.73	9.90	4,563 (a)	.....
Feb. 23....	“	201	267	2.25	6.87	600 (b)	.....
Mar. 29....	“	256	2,154	7.49	14.67	16,139	.....
“ 31....	“	262	1,828	7.24	13.48	13,593	.....
Aug. 22....	“	181	175	.76	6.38	133	.....

(a) Surface velocities.
(b) Ice on control.

Daily Gauge Height and Discharge of Thames River (main stream) near Byron for 1915-6

Drainage Area, 1270 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.	
	Feet	Dis-charge	Feet	Dis-charge	Feet	Dis-charge	Feet	Dis-charge	Feet	Dis-charge	Feet	Dis-charge	Feet	Dis-charge	Feet	Dis-charge	Feet	Dis-charge	Feet	Dis-charge	Feet	Dis-charge	Feet	Dis-charge
1	6.67	402	8.87	3000	7.50	1180	12.58	10650	6.83	525	12.04	9300	7.42	1100	9.96	4830	6.75	440	6.33	118	6.33	118	6.46	208
2	6.71	428	8.29	2200	9.46	3940	9.83	4590	6.83	525	11.92	9010	7.29	970	8.71	2760	6.75	440	6.50	240	6.33	118	6.42	176
3	6.67	402	7.96	1770	11.29	7540	8.62	2640	6.87	555	10.37	5640	7.54	1230	8.92	3080	6.75	440	6.42	176	6.33	118	6.42	176
4	6.58	352	7.75	1500	10.71	6320	7.29	970	6.83	525	9.58	4140	8.54	2530	8.62	2640	6.67	376	6.33	118	6.33	118	6.37	142
5	6.62	372	7.62	1330	11.54	8100	7.29	970	6.75	460	9.17	2470	8.12	1980	8.46	2420	6.67	376	6.33	118	6.33	118	6.33	118
6	6.67	402	7.50	1180	15.50	18450	7.42	1100	6.83	525	8.96	3140	7.67	1380	8.29	2300	6.67	376	6.33	118	6.33	118	6.33	118
7	6.67	402	7.46	1140	11.96	9100	7.21	890	6.87	555	8.50	2470	7.42	1100	7.96	1770	6.67	376	6.27	85	6.29	95	6.33	118
8	6.54	336	7.33	1010	10.71	6320	6.67	402	6.92	600	8.17	2040	7.58	1280	11.12	7160	6.58	304	6.29	95	6.33	118	6.33	118
9	6.58	352	7.33	1010	9.46	3940	6.87	555	7.00	680	8.00	1820	8.04	1870	10.29	5480	6.50	240	6.37	142	6.33	118	6.25	75
10	6.58	352	7.25	930	9.08	3330	7.00	680	7.00	680	7.83	1600	8.08	1920	9.08	3330	6.50	240	6.33	118	6.33	118	6.25	75
11	6.58	352	7.17	850	9.29	3660	7.08	760	7.04	720	7.67	1390	10.96	6820	8.54	2530	6.50	240	6.46	208	6.29	95	6.25	75
12	6.58	352	7.00	680	8.87	3000	7.12	800	6.92	600	8.08	1920	9.42	3870	8.62	2640	6.58	304	6.37	142	6.33	118	6.37	142
13	6.67	402	6.92	600	12.79	11170	7.12	800	6.87	555	8.83	2940	8.21	2090	8.17	2040	6.62	336	6.37	142	6.25	75	6.46	208
14	6.67	402	6.79	492	10.96	6820	7.37	1050	6.96	640	10.79	6480	7.79	1550	7.71	1440	6.71	408	6.42	176	6.25	75	6.46	208
15	6.62	372	6.75	460	9.71	4380	7.67	1390	7.00	680	11.29	7540	9.04	3260	7.46	1140	6.58	304	6.37	142	6.33	118	6.50	240
16	6.67	402	7.04	720	8.58	2580	7.33	1010	7.08	760	9.46	3940	10.79	6820	7.58	1280	6.71	408	6.33	118	6.29	95	6.46	208
17	6.67	402	7.08	760	11.92	9010	7.12	800	6.96	640	9.46	3940	10.79	6820	7.04	720	6.54	272	6.33	118	6.29	95	6.46	208
18	6.67	402	7.17	850	11.33	7630	7.04	720	7.25	930	9.87	5670	9.83	4590	7.71	1440	6.50	240	6.29	95	6.29	95	6.42	176
19	6.92	680	7.50	1180	11.54	8100	7.00	680	6.96	640	9.04	3260	9.08	3330	7.71	1440	6.50	240	6.29	95	6.29	95	6.42	176
20	9.42	3870	7.62	1330	11.62	8290	6.92	600	7.00	680	8.42	2370	8.75	2820	7.54	1230	6.46	208	6.33	118	6.33	118	6.62	336
21	9.29	3660	7.58	1280	11.83	8790	6.83	525	6.87	555	8.46	2420	8.58	2580	7.37	1050	6.42	176	6.37	142	6.29	95	6.75	440
22	8.62	2640	7.54	1230	14.12	14720	6.92	600	6.83	525	8.46	2420	8.00	1820	7.21	890	6.42	176	6.33	118	6.25	75	6.71	408
23	8.08	1920	7.46	1140	13.54	13160	6.83	525	6.96	640	8.37	2300	10.58	6060	7.04	720	6.46	208	6.33	118	6.25	75	6.58	804
24	8.17	2040	7.58	1280	12.46	10350	6.87	555	6.87	555	8.27	2300	9.87	4670	7.08	760	6.42	176	6.33	118	6.33	118	6.50	240
25	7.71	1440	7.67	1390	10.04	4980	6.83	525	7.00	680	7.87	1650	8.79	2880	7.33	1010	6.42	176	6.33	118	6.33	118	6.50	240
26	7.83	1600	7.58	1280	9.50	4000	6.87	555	7.58	1280	8.08	1920	8.00	1820	7.33	1010	6.46	208	6.33	118	6.33	118	6.42	176
27	8.25	2140	7.79	1550	10.04	4980	6.83	525	11.33	7630	8.79	2880	7.67	1390	7.42	1100	6.54	272	6.33	118	6.33	118	6.42	176
28	9.75	4450	7.75	1500	13.50	13050	6.87	555	14.71	16320	8.67	2710	8.29	2200	7.12	800	6.42	176	6.33	118	6.37	142	6.42	176
29	9.50	4000	7.62	1330	10.67	6240	6.92	600	14.33	15290	8.00	1820	8.54	2530	6.92	600	6.42	176	6.33	118	6.46	208	6.46	208
30	9.96	4830	7.42	1100	9.67	4310	.....	.....	14.25	15080	7.67	1390	13.00	11700	6.83	510	6.42	176	6.33	118	6.50	240	6.46	208
31	.....	.....	7.50	1180	12.42	10250	.....	.....	12.96	11600	.....	.....	11.79	8700	.....	.....	6.25	75	6.33	118	.....	.....	6.50	240

Monthly Discharge of Thames River near Byron for 1915-6

Drainage Area, 1,270 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November. (1915)	4,830	336	1,336	3.80	.26	1.05	1.17
December . . .	3,000	460	1,202	2.36	.36	.95	1.10
January... (1916)	18,450	1,180	7,345	14.53	.93	5.78	6.66
February	10,650	402	1,277	8.39	.32	1.01	1.09
March	16,320	460	2,665	12.85	.36	2.10	2.42
April	9,300	1,390	3,437	7.32	1.09	2.71	3.02
May.....	11,700	970	3,334	9.21	.76	2.63	3.03
June.....	7,160	510	2,001	5.64	.40	1.58	1.76
July.....	440	75	276	.35	.06	.22	.25
August	240	85	129	.19	.07	.10	.12
September	240	75	116	.19	.06	.09	.10
October.....	440	75	197	.35	.06	.16	.18
The year	18,450	75	1,949	14.53	.06	1.53	20.82

Thames River (North Branch) near Fanshawe

Location—At the highway bridge near Fanshawe Post Office, between lots 8 and 9, concessions 4 and 5, Township of London, County of Middlesex.

Records Available—Daily gauge heights and discharge measurements from May 13, 1915, to October 31, 1916.

Drainage Area—650 square miles.

Gauge—Vertical staff 0 to 12 feet on right abutment, downstream side. Elevation of zero on gauge 4.00 is referred to a B.M. (elevation 30.00) on tension rod, downstream side, 170 feet from the initial point of soundings.

Channel and Control—The channel is straight above and below section for 500 feet. The bed of the stream is composed of clay and gravel, the banks are high and will not overflow. The channel and control is shifting during high-water periods.

Discharge Measurements—Made from the bridge and at a permanent wading section about 500 feet above during low water.

Accuracy—There are not sufficient records available to define rating curve at all stages.

Observer—Allen Donley, London.

Discharge Measurements of Thames River (North Branch) near Fanshawe in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
— 1915							
Nov. 12....	Yeates, W	90	155	.82	6.87	127	.....
— 1916							
Jan. 25....	"	171	904	2.25	9.15	2,038 (a)	.....
Mar. 29....	"	171	1,264	4.71	11.29	5,953 (b)	.....
" 31....	"	171	1,230	4.14	11.00	5,091	.....
Aug. 22....	"	28	17	1.08	6.10	18	.....

(a) Heavy swell at gauge.

(b) Reading taken 500 feet above gauge.

Daily Gauge Height and Discharge of Thames River (North Branch) near Fanshawe for 1915-6

Drainage Area, 650 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	7.02	156	8.67	1360	8.75	1460	8.83	940	9.25	390	10.35	4000	7.58	390	9.83	3080	7.62	412	6.25	28	6.10	18	6.54	58
2	6.98	145	8.50	1160	9.75	2950	8.79	795	8.98	380	9.98	3330	7.79	520	9.96	3300	7.48	340	6.33	35	6.19	23	6.48	51
3	6.96	140	8.12	770	13.33	10840	8.92	705	8.69	375	9.83	3080	8.04	695	9.58	2680	7.39	296	6.25	28	6.14	20	6.52	56
4	6.94	135	8.08	730	13.00	9980	12.46	660	8.50	365	9.69	2850	8.01	850	9.25	2170	7.31	264	6.35	37	6.10	18	6.39	41
5	6.81	102	7.89	645	12.62	9000	11.81	625	8.46	355	9.58	2680	8.08	730	8.87	1630	7.23	232	6.27	30	6.06	16	6.29	31
6	6.77	95	7.85	555	12.29	8170	11.81	625	8.42	350	9.04	1870	7.81	530	8.50	1160	7.23	232	6.21	25	6.04	14	6.27	30
7	6.71	85	7.75	490	11.75	6850	11.03	590	8.23	350	8.67	1360	7.69	454	8.27	910	7.13	197	6.23	26	6.10	18	6.19	23
8	6.67	80	7.71	465	11.58	6450	12.03	590	8.17	350	8.60	1280	7.67	442	8.06	715	7.10	187	6.23	26	6.14	20	6.19	23
9	6.71	85	7.67	440	11.25	5720	11.94	590	8.10	340	8.42	1070	7.60	400	7.85	555	7.04	169	6.27	30	6.10	18	6.14	20
10	6.79	98	7.58	390	10.71	4670	11.79	555	7.87	330	8.08	730	7.85	555	8.48	1140	6.94	139	6.19	23	6.10	18	6.08	17
11	6.87	118	7.58	390	9.75	2950	11.60	555	7.75	325	8.00	660	8.87	1630	8.27	910	6.96	145	6.10	18	6.14	20	6.10	18
12	6.98	145	7.56	380	8.96	1750	11.14	545	7.79	315	8.37	1020	8.62	1300	8.12	770	6.98	151	6.10	18	6.14	20	6.04	14
13	6.85	112	7.75	490	9.33	2290	9.87	525	7.83	305	8.71	1410	8.04	695	8.14	785	7.02	163	6.23	26	6.19	23	6.06	16
14	6.85	112	7.75	490	8.67	1360	9.75	525	7.73	300	8.54	1210	7.71	466	7.96	630	6.94	139	6.14	26	6.10	18	6.14	20
15	6.75	92	7.75	490	8.54	1210	9.75	525	7.64	296	9.75	2950	9.08	1920	7.77	505	6.81	104	6.10	18	6.14	20	6.14	20
16	6.87	118	8.08	730	8.50	1160	9.75	525	7.53	288	8.83	3080	9.37	2350	7.67	442	6.73	88	6.14	18	6.19	23	6.14	20
17	6.81	102	8.08	730	8.50	1160	9.75	505	7.44	284	9.81	3050	9.17	2050	7.62	412	6.69	80	6.10	18	6.14	20	6.08	17
18	6.79	98	8.25	890	8.50	1160	9.75	492	7.42	280	9.69	2850	8.75	1460	7.62	412	6.64	72	6.19	23	6.19	23	6.14	20
19	6.96	140	8.54	1210	10.29	2250	9.50	460	7.37	288	9.56	2650	8.37	1020	7.52	360	6.64	72	6.10	18	6.10	18	6.23	26
20	9.46	2490	8.54	1210	10.29	2250	9.50	460	7.37	288	9.56	2650	8.37	1020	7.52	360	6.64	72	6.19	23	6.19	23	6.23	26
21	8.96	1750	8.52	1180	10.00	2250	9.50	460	7.35	288	9.40	2400	8.21	850	7.60	400	6.62	69	6.19	23	6.04	14	6.31	33
22	8.04	695	8.50	1160	9.42	2250	9.50	440	7.29	272	8.67	1360	7.98	645	7.54	370	6.39	41	6.10	18	6.10	18	6.46	49
23	7.96	630	8.50	1160	9.42	2250	9.50	440	7.29	256	8.67	1360	7.98	645	7.54	370	6.39	41	6.10	18	6.10	18	6.46	49
24	7.94	620	8.50	1160	9.37	2250	9.50	442	7.27	248	8.12	770	7.83	1440	7.67	442	6.42	44	6.14	20	6.10	18	6.42	44
25	8.23	870	8.50	1160	9.33	2250	9.50	430	7.26	244	8.29	930	8.42	1070	7.85	555	6.29	31	6.06	16	6.14	20	6.37	39
26	9.33	2300	8.50	1160	9.50	2550	9.50	430	8.12	770	7.92	605	7.81	605	7.81	530	6.25	28	6.12	19	6.23	26	6.42	44
27	9.50	2550	9.50	1160	11.17	5560	9.48	412	10.25	3820	8.29	930	7.67	442	7.75	492	6.25	28	6.17	22	6.14	20	6.42	44
28	9.33	2300	8.50	1160	10.62	4510	9.44	400	11.50	6270	8.25	890	7.54	370	7.73	480	6.25	28	6.14	20	6.10	18	6.39	41
29	9.29	2230	8.50	1160	8.54	1210	9.47	400	11.27	5760	7.92	605	7.46	330	7.69	454	6.25	28	6.12	19	6.27	30	6.37	39
30	9.08	1920	8.50	1160	8.50	1160	.....	.....	10.77	4780	7.92	605	7.46	330	7.69	454	6.25	28	6.14	20	6.12	19	6.23	26
31	.....	.....	8.50	1160	8.71	1100	.....	.....	10.42	4130	.....	.....	8.42	1070	.....	.....	6.25	28	6.17	22	.....	.....	6.19	23

Monthly Discharge of Thames River (North Branch) near Fanshawe for 1915-6

Drainage Area 650 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
November (1915).	2,550	80	684	3.92	.12	1.05	1.17
December ..	1,360	380	864	2.09	.58	1.33	1.53
January (1916).	10,840	1,100	3,544	16.68	1.69	5.45	6.28
February	940	400	541	1.45	.62	.83	.90
March	6,270	244	1,077	9.65	.38	1.66	1.91
April	4,000	605	1,786	6.25	.93	2.75	3.07
May	2,350	330	922	3.62	.51	1.42	1.64
June	3,300	360	923	5.08	.66	1.42	1.58
July	412	28	126	.64	.04	.19	.22
August	37	16	23	.06	.02	.04	.05
September	30	14	20	.05	.02	.03	.03
October	58	14	32	.09	.02	.05	.06
The year	10,840	14	881	16.68	.02	1.36	18.51

Thames River (South Branch) near Ealing

Location—At the highway bridge known as Vauxhall Bridge between lots 10 and 11, concession B, between Townships of London and Westminster, County of Middlesex.

Records Available—Daily gauge heights and discharge measurements from May 11, 1915, to October 31, 1916.

Drainage Area—515 square miles.

Gauge—Vertical staff 0 to 12 feet on downstream side of first right pier. Elevation of zero on gauge is 4.00, referred to B.M., elevation 30.00.

Channel and Control—The channel is straight above and below for 800 feet. The banks and control are shifting under high-water conditions.

Discharge Measurements—Made from the bridge. During the extreme low water a wading section is used.

Winter Flow—The relation of gauge height to discharge is affected by ice during the winter months.

Accuracy—The rating curve is fairly well defined up to gauge height 11.00 feet.

Observer—Geo. Leathorn, London.

Discharge Measurements of Thames River (South Branch) near Ealing in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 12....	Yeates, W....	151	235	.85	6.46	201	.....
1916							
Jan. 24....	“	193	1,185	2.40	11.83	2,849 (a)	.....
Mar. 29....	“	193	1,358	3.81	12.71	5,178	.....
“ 31....	“	193	1,107	3.15	11.35	3,485	.....
Aug. 23....	“	86	87	1.06	6.09	92 (b)	.....

(a) Ice on both sides and bed of stream.
(b) Reading taken 500 feet above gauge.

Daily Gauge Height and Discharge of Thames River (South Branch) near Ealing for 1915-6

Drainage Area, 515 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.		Gauge Ht.	
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	6.50	210	8.33	955	7.83	705	12.25	4540	7.33	500	10.79	2890	7.21	455	9.64	1840	6.62	246	6.10	100	5.92	64	6.12	105
2	6.52	216	7.83	705	9.50	890	9.96	2100	7.29	485	10.42	2520	7.42	540	8.80	1230	6.50	210	6.12	105	5.92	64	6.00	80
3	6.42	186	7.54	585	13.46	2600	8.75	1200	7.25	470	9.69	1880	7.60	610	9.14	1470	6.60	240	6.12	105	5.92	64	6.00	80
4	6.44	192	7.25	470	13.83	6540	7.37	520	7.33	500	9.04	1400	8.14	860	8.71	1180	6.52	216	6.08	96	5.92	64	5.96	72
5	6.44	192	7.27	478	13.08	5560	7.83	705	7.25	470	8.69	1130	7.89	735	8.58	1200	6.54	222	6.12	105	5.92	64	5.96	72
6	6.54	222	7.21	454	12.87	5290	7.31	495	7.25	470	8.79	1130	7.50	570	8.75	1100	6.37	173	6.02	84	5.92	64	5.96	72
7	6.37	173	7.10	410	11.75	3940	7.42	490	7.33	500	8.33	955	7.29	485	8.42	1000	6.39	177	6.08	96	5.92	64	5.96	72
8	6.33	163	7.08	403	10.25	2360	8.08	490	7.46	553	8.12	850	7.33	500	11.06	3170	6.25	137	6.12	105	6.17	118	6.00	80
9	6.33	163	7.08	403	9.37	1630	9.12	490	7.58	600	7.85	715	7.67	640	10.67	2770	6.31	158	6.12	105	6.08	96	5.83	50
10	6.42	186	7.00	375	9.00	1370	8.62	490	7.58	600	7.79	685	7.89	735	9.25	1540	6.25	137	6.00	80	6.06	92	6.04	88
11	6.42	186	7.12	418	9.00	1370	8.08	490	7.50	570	7.62	620	9.67	1870	8.83	1250	6.33	162	6.12	105	5.83	50	5.92	64
12	6.48	204	7.21	454	9.00	1370	8.08	490	7.50	570	8.08	790	8.75	1200	8.56	1090	6.31	158	6.14	110	5.96	72	5.92	64
13	6.54	222	7.37	520	10.79	2890	8.08	490	7.62	620	8.98	1360	8.02	800	8.12	850	6.29	147	6.17	117	5.92	64	6.00	80
14	6.39	177	7.31	494	10.79	2890	8.08	490	7.62	620	8.98	1360	8.02	800	8.12	850	6.29	147	5.96	72	5.92	64	6.25	137
15	6.46	198	7.25	470	9.75	1930	8.08	490	7.50	570	10.25	2360	9.25	1540	7.37	520	6.23	132	6.10	100	5.92	64	6.25	137
16	6.40	180	7.17	438	8.71	1180	8.08	490	7.52	580	9.29	1570	10.37	2470	7.35	510	6.25	137	6.04	88	5.92	64	6.19	122
17	6.42	186	7.21	454	7.54	585	8.08	490	7.50	570	9.29	1570	10.77	2870	7.62	620	6.23	132	6.10	100	5.96	72	6.23	132
18	6.37	173	7.50	570	7.50	570	8.08	490	7.42	540	9.75	1930	9.67	1870	7.71	655	6.29	147	5.94	68	5.83	50	6.08	96
19	7.71	655	7.83	705	7.37	520	8.08	490	7.42	540	8.87	1280	8.87	1280	7.81	695	6.17	117	6.00	80	5.92	64	6.23	132
20	8.62	1120	7.81	695	7.42	540	7.96	490	7.33	500	8.29	935	8.44	1010	7.54	585	6.25	137	6.06	92	5.92	64	6.50	210
21	8.75	1200	7.67	640	7.67	570	7.79	490	7.42	540	8.27	925	8.12	850	7.33	500	6.23	132	5.89	58	5.92	64	6.69	227
22	8.42	1000	7.58	600	10.50	1370	7.75	490	7.37	520	8.17	875	7.89	735	7.23	462	6.23	137	6.00	80	5.92	64	6.54	262
23	8.17	875	7.58	600	10.29	1440	7.75	490	7.35	510	8.08	830	10.94	3040	7.00	375	6.12	105	5.98	76	5.92	64	6.35	167
24	7.75	670	7.71	655	9.33	1440	7.62	490	7.33	500	7.94	760	9.52	1750	7.06	396	6.12	105	6.04	88	5.92	64	6.31	177
25	7.56	595	7.64	625	9.75	1440	7.58	490	7.44	545	7.77	680	8.85	1260	7.23	462	6.27	142	6.08	96	5.81	47	6.31	157
26	7.50	570	7.54	585	9.12	1440	7.46	490	8.87	1280	7.89	735	8.02	800	7.14	426	6.17	117	5.92	64	5.92	64	6.21	127
27	7.83	705	7.79	685	9.42	1670	7.31	495	10.54	2630	8.04	810	7.46	655	7.44	545	6.08	96	6.00	80	5.92	64	6.12	105
28	8.42	1000	7.79	685	11.58	3740	7.25	470	13.67	6340	8.89	1290	8.19	885	6.89	337	6.04	88	5.87	55	5.92	64	6.10	100
29	8.54	1070	7.67	640	10.08	2210	7.42	540	13.04	5510	7.69	645	8.08	830	6.75	288	6.04	88	6.00	80	6.25	138	6.12	105
30	8.69	1160	7.50	570	9.33	1600	.....	.....	12.25	4540	7.37	520	9.98	2120	6.71	280	6.08	96	5.96	72	6.29	148	6.00	80
31	.....	.....	7.83	705	11.67	3840	.....	.....	11.29	3420	.....	.....	11.02	3120	.....	.....	5.96	72	6.00	80	.....	.....	6.10	100

Monthly Discharge of Thames River (South Branch) near Ealing for 1915-6

Drainage Area 515 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915).	1,200	163	468	2.33	.32	.91	1.02
December ..	955	375	565	1.85	.73	1.10	1.27
January (1916).	6,540	520	2,140	12.70	1.01	4.16	4.80
February	4,540	470	719	8.82	.91	1.40	1.51
March.....	6,330	470	1,198	12.29	.91	2.33	2.69
April.....	2,890	520	1,233	5.61	1.01	2.39	2.67
May	3,120	455	1,212	6.06	.88	2.35	2.71
June	3,170	280	933	6.16	.54	1.81	2.02
July.....	246	72	145	.48	.14	.28	.32
August.....	105	55	124	.20	.11	.24	.28
September.....	148	50	72	.29	.10	.14	.16
October.....	267	64	115	.52	.12	.22	.25
The year.....	6,540	50	745	12.70	.10	1.45	19.74

Regular Stations

SOUTH-WESTERN ONTARIO DISTRICT

Grand River and Tributaries

River	Location	Drain- age Area Sq. Miles	Township	County or District
Grand	at Belwood	280	Garafraxa	Wellington Co.
"	at Brantford	2,000	Brantford	Brant Co.
"	near Conestogo	550	Woolwich	Waterloo Co.
"	at Galt	1,360	North Dumfries	"
"	at Glen Morris	1,390	South Dumfries	Brant Co.
"	at York	2,280	Oneida	Haldimand Co.
Boston Creek	near York	125	"	"
Conestogo	at St. Jacob's	305	Woolwich	Waterloo Co.
Fairochild's Creek ..	near Onondaga	115	Onondaga	Brant Co.
Galt Creek	at Galt	45	North Dumfries	Waterloo Co.
Irvine	near Salem	67	Nichol	Wellington Co.
Nith	near Canning	365	Blenheim	Oxford Co.
Speed	near Guelph	77	Guelph	Wellington Co.
"	at Hespeler	250	Waterloo	Waterloo Co.
Whiteman's Creek ..	near Burford	154	Brantford	Brant Co.

Grand River at Belwood

Location—At the bridge in the Village of Belwood, on the 7th concession, Township of Garafraxa, County of Wellington.

Records Available—August 31, 1913, to October 31, 1916.

Drainage Area—280 square miles.

Gauge—Vertical steel staff 0 to 12 feet on right abutment. Elevation of zero on gauge is 1366.00, which has remained unchanged since established.

Channel and Control—The channel is straight for about 400 feet above and 600 feet below gauging section. The channel bed at the bridge is solid rock, and permanent at all stages. At the permanent low water section, however, the channel is shifting under high water conditions.

Winter Flow—During the winter months the relation of gauge height to discharge is greatly affected by ice, and readings are taken to determine the winter discharge.

Accuracy—The river stage at this section is not affected by any power plants above or below. The rating curve is well defined, and estimates are considered good.

Observer—Lloyd Mesure, Belwood P.O.

Discharge Measurements of Grand River at Belwood in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 9....	Cunnington G...	65	43	1.69	1,367.29	73	.....
1916							
Feb. 3....	Roberts E.	110	552	1.90	1,369.00	1,050 (a)	.....
" 18....	"	95	59	1.16	1,367.82	69 (b)	.....
Mar. 30....	Cunnington G...	110	718	3.73	1,370.50	2,680	.....
" 30....	"	110	718	3.70	1,370.44	2,646	.....
Apr. 1....	"	110	806	5.57	1,371.33	4,487	.....
" 1....	"	110	806	5.84	1,371.33	4,708	.....
May 9....	Roberts E	110	410	.60	1,367.76	246	.....
Oct. 6....	"	63	14	.38	1,366.83	5	.....

(a) Slush and ice in stream; section has been scoured by freshets.

(b) Ice on control.

Daily Gauge Height and Discharge of Grand River at Belwood for 1915-6

Drainage Area, 280 Square Miles

Date	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	1367.33	72	1368.16	444	1367.98	145	1369.87	1960	1367.46	55	1371.42	4910	1367.67	205	1367.83	293	1367.17	25	1366.83	5	1366.75	2	1366.85	6
2	1367.29	62	1368.08	393	1368.17	155	1368.96	1070	1367.50	55	1370.46	2650	1367.87	317	1367.62	180	1367.10	15	1366.83	5	1366.81	4	1366.83	5
3	1367.29	62	1367.87	275	1368.21	175	1368.96	680	1367.50	55	1370.17	2300	1368.12	474	1367.67	205	1367.12	18	1366.83	5	1366.79	4	1366.83	5
4	1367.29	62	1367.83	255	1368.14	218	1368.42	530	1367.50	55	1369.58	1640	1368.50	740	1367.58	160	1367.08	14	1366.83	5	1366.79	4	1366.83	5
5	1367.33	72	1367.83	255	1368.42	290	1368.42	395	1367.50	55	1369.37	1430	1368.50	395	1367.58	160	1367.08	14	1366.83	5	1366.75	2	1366.83	5
6	1367.33	72	1367.58	147	1369.33	860	1368.37	365	1367.50	55	1369.14	1230	1367.75	248	1367.50	120	1367.04	13	1366.83	5	1366.75	2	1366.83	5
7	1367.31	68	1367.58	147	1369.96	1250	1368.12	305	1367.54	70	1369.00	1100	1367.50	120	1367.39	82	1367.02	12	1366.83	5	1366.75	2	1366.83	5
8	1367.29	62	1367.58	147	1369.62	1185	1368.08	275	1367.58	85	1368.83	970	1367.54	140	1367.42	92	1367.00	11	1366.83	5	1366.75	2	1366.83	5
9	1367.31	68	1367.46	108	1369.31	1120	1368.08	248	1367.58	85	1368.54	770	1367.71	225	1367.42	92	1367.00	11	1366.83	5	1366.79	2	1366.89	7
10	1367.29	62	1367.46	108	1369.25	990	1368.08	248	1367.54	55	1368.50	740	1367.71	225	1367.35	70	1366.96	9	1366.83	5	1366.77	2	1366.92	8
11	1367.33	72	1367.58	102	1369.17	665	1368.00	220	1367.50	55	1368.83	970	1368.04	421	1367.60	170	1366.96	9	1366.83	5	1366.75	2	1366.87	6
12	1367.33	72	1367.58	102	1369.17	665	1368.00	220	1367.50	55	1369.00	1100	1367.83	293	1367.60	170	1366.92	8	1366.83	5	1366.75	2	1366.96	9
13	1367.31	68	1367.58	96	1369.79	990	1367.92	170	1367.54	55	1369.87	1960	1367.60	170	1367.54	140	1366.92	8	1366.83	5	1366.75	2	1366.96	9
14	1367.33	72	1367.58	90	1369.75	960	1367.87	70	1367.50	55	1370.75	3110	1367.46	106	1367.42	92	1366.92	8	1366.79	4	1366.75	2	1367.00	11
15	1367.29	62	1367.62	105	1369.37	795	1367.87	85	1367.58	85	1370.08	2200	1367.56	150	1367.42	92	1366.87	6	1366.79	4	1366.75	2	1366.96	9
16	1367.29	62	1367.67	105	1369.21	600	1367.75	85	1367.58	85	1369.42	1480	1367.67	205	1368.00	395	1366.92	8	1366.75	2	1366.75	2	1366.96	9
17	1367.29	62	1367.67	120	1369.08	535	1367.79	85	1367.58	85	1369.75	1820	1367.77	258	1368.25	565	1366.96	9	1366.75	2	1366.77	2	1366.94	9
18	1367.33	72	1367.69	120	1368.87	438	1367.83	85	1367.50	85	1369.50	1550	1367.69	215	1368.21	535	1366.92	8	1366.75	2	1366.77	2	1366.92	8
19	1367.96	323	1367.69	111	1368.75	345	1367.77	85	1367.50	55	1369.17	1250	1367.58	160	1368.04	421	1366.92	8	1366.75	2	1366.75	2	1367.02	12
20	1368.54	690	1367.67	111	1368.67	318	1367.79	85	1367.50	55	1370.08	2200	1367.54	140	1367.81	281	1366.94	9	1366.75	2	1366.75	2	1367.12	18
21	1368.08	393	1367.75	127	1368.62	195	1367.75	85	1367.50	55	1369.54	1590	1367.44	99	1367.58	160	1367.17	25	1366.75	2	1366.79	2	1367.12	18
22	1367.87	275	1367.75	145	1370.31	3020	1367.75	85	1367.50	55	1371.37	4740	1367.39	82	1367.60	170	1367.06	13	1366.77	3	1366.83	5	1367.12	18
23	1367.67	183	1367.75	145	1370.33	1770	1367.62	85	1367.50	55	1370.46	2650	1367.73	236	1367.42	92	1367.00	11	1366.79	4	1366.83	5	1367.08	14
24	1367.71	200	1367.75	145	1369.71	1280	1367.75	85	1367.50	61	1369.37	1430	1367.62	180	1367.37	76	1367.00	11	1366.79	4	1366.83	5	1366.96	9
25	1367.75	217	1367.75	145	1369.12	1020	1367.62	85	1367.54	102	1369.19	1270	1367.54	140	1367.50	120	1366.96	9	1366.83	5	1366.83	5	1366.94	9
26	1368.83	880	1367.75	145	1369.33	1400	1367.67	70	1367.79	270	1369.21	1290	1367.35	70	1367.42	92	1366.92	8	1366.83	5	1366.83	5	1366.92	8
27	1369.08	1040	1367.79	145	1370.42	2600	1367.50	55	1368.31	605	1369.00	1100	1367.50	120	1367.33	64	1366.92	8	1366.82	5	1366.83	5	1366.92	8
28	1369.06	1030	1367.81	145	1371.04	5200	1367.58	55	1369.04	1140	1368.83	970	1368.87	1000	1367.25	42	1366.89	7	1366.80	4	1366.85	6	1366.92	8
29	1368.46	640	1367.83	145	1369.25	1320	1367.58	55	1370.46	2650	1368.65	845	1368.17	510	1367.25	42	1366.83	5	1366.75	2	1366.96	9	1366.92	8
30	1367.62	163	1367.83	145	1369.17	1250	.....	.....	.....	.....	1371.37	4740	1368.58	795	1368.50	740	1367.25	42	1366.83	5	1366.92	8	1366.92	8
31	.....	.....	1367.83	145	1370.83	3270	.....	.....	.....	.....	.....	.....	1368.21	535	.....	.....	1366.83	5	1366.75	2	.....	.....	1366.94	9

Monthly Discharge of Grand River at Belwood for 1915-6

Drainage Area, 280 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November. (1915)	1,040	62	241	3.71	.22	.86	.96
December . "	444	90	159	1.59	.32	.57	.66
January .. (1916)	5,200	145	1,137	18.57	.52	4.06	4.68
February	1,960	55	273	7.00	.20	.95	1.05
March	5,060	55	520	18.07	.20	1.86	2.14
April	4,910	470	1,735	17.54	1.68	6.20	6.91
May	1,000	70	288	3.57	.25	1.03	1.19
June	565	42	174	2.02	.15	.62	.69
July	25	5	11	.09	.02	.04	.05
August	5	2	4	.02	.01	.01	.01
September	9	2	3	.03	.01	.01	.01
October	18	5	9	.06	.02	.03	.03
The year	5,200	2	378	18.57	.01	1.35	18.38

Grand River at Brantford

Location—At the Toronto-Hamilton-Brantford Railway bridge in the City of Brantford, County of Brant.

Records Available—Discharge measurements from August, 1912, to October 31, 1916.
Daily gauge heights from July 8, 1913, to October 31, 1916.

Drainage Area—2,000 square miles.

Gauge—Vertical steel staff, 0 to 12 feet on left abutment. Elevation of zero on gauge is 643.00, which has remained unchanged since established.

Channel and Control—The bed is not shifting under ordinary conditions. The channel above has been narrowed considerably by the building of the Lake Erie & Northern Railway right-of-way. Directly below section a bridge for this same railway is now built that has four piers, the back water from which is quite apparent. During the freshet, ice is liable to jam at this point. During the spring floods of 1916, the bed of stream scoured, so that former curve at low gauge heights is applicable.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice, and measurements are made to determine the winter flow.

Regulation—The Western Counties Electric Company have a dam 1,000 feet above this section that causes fluctuations that are noticeable in the river stage. Their plant is running at its full capacity. The observed mean gauge height does not give the correct mean daily stage.

Diversions—The Western Counties Electric Company use about 50 second feet for power purposes at times.

Accuracy—With the exception of a slight angle at section these records can be classified as good. The back water caused through the construction work of the Lake Erie & Northern Railway bridge, 150 feet below this section, necessitated the use of more than one curve.

Observer—John Anguish, Brantford.

Discharge Measurement of Grand River at Brantford in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 3....	Yeates, W	341	960	.81	645.18	779 (a)	.....
Dec. 29....	"	341	1,040	.86	645.59	897 (b)	.....
1916							
Jan. 3....	Roberts, E	364	1,264	1.35	646.21	1,707 (c)	.....
" 29....	"	373	3,383	3.19	651.64	10,788 (d)	.....
Feb. 1....	Yeates, W,	373	3,756	4.82	652.77	18,100 (e)	.....
" 16....	Roberts, E,	359	1,203	.89	646.08	1,071 (f)	.....
" 21....	"	278	834	.77	645.08	638 (g)	.....
Mar. 2....	"	278	842	.79	645.35	670 (h)	.....
" 8....	Yeates, W,	278	816	.95	645.40	778 (f)	.....
" 13....	"	278	771	.99	645.21	765 (f)	.....
" 22....	"	278	761	.94	645.21	721 (h)	.....
" 23....	"	278	761	.93	645.19	719 (h)	.....
" 24....	"	278	782	.97	645.31	768 (h)	.....
" 25....	"	278	782	.96	645.26	651 (i)	.....
June 19....	"	371	1,721	2.16	646.88	3,711 (j)	.....
" 20....	"	366	1,646	1.96	646.65	3,226 (j)	.....
" 21....	"	364	1,501	1.81	646.33	2,712 (j)	.....
" 22....	"	364	1,391	1.49	646.00	2,076	.....
" 23....	"	363	1,355	1.32	645.87	1,782	.....
" 26....	"	365	1,574	1.84	646.50	2,889	.....
" 27....	"	364	1,428	1.57	646.08	2,244	.....
" 28....	"	363	1,283	1.23	645.70	1,576	.....
" 29....	"	361	1,173	1.14	645.43	1,346	.....
" 30....	"	361	1,210	1.21	645.49	1,466	.....
Aug. 5....	"	306	908	.48	644.58	433	.....
" 7....	"	306	908	.61	644.64	453	.....
Sept. 7....	"	288	877	.52	644.50	556	.....
" 8....	"	290	869	.47	644.48	405	.....
" 11....	"	307	906	.54	644.60	494	.....
" 12....	"	273	780	.31	644.17	244	.....
" 13....	"	246	756	.24	644.04	178	.....
" 15....	"	288	877	.47	644.48	415	.....
" 19....	"	288	877	.50	644.50	438	.....
" 28....	"	219	703	.16	643.87	110	.....
" 29....	"	278	840	.38	644.31	319	.....

From 7 p.m. to 7 a.m. the only water passing this section is leakage from the dams above during low-water periods.

- (a) Construction work below section.
- (b) Ice above, control clear.
- (c) Ice on section and control.
- (d) Ice jams forming and breaking.
- (e) New piers completed below section.
- (f) Ice on section and control.
- (g) Thin ice on control.
- (h) Ice on control.
- (i) Thawing—ice effect diminishing.
- (j) Section scouring.

Monthly Discharge of Grand River at Brantford for 1915-6

Drainage Area, 2,000 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile.			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915).	6,260	620	1,645	3.13	.31	.82	.91
December	3,520	710	1,138	1.76	.35	.57	.66
January (1916).	19,860	1,150	6,337	9.93	.58	3.17	3.65
February	17,330	600	1,918	8.66	.30	.96	1.04
March	23,060	520	3,069	11.53	.26	1.53	1.76
April.....	15,480	2,100	6,419	7.74	1.05	3.21	3.58
May.....	10,510	1,900	3,284	5.26	.95	1.64	1.89
June	6,440	1,120	3,387	3.22	.56	1.69	1.89
July	1,080	422	633	.54	.21	.32	.37
August	510	373	441	.26	.19	.22	.25
September	540	163	295	.27	.08	.15	.17
October	905	278	498	.46	.14	.25	.29
The year.....	23,060	163	2,419	11.53	.08	1.21	16.46

Grand River near Conestogo

Location—At the highway bridge $\frac{1}{4}$ mile below the Village of Conestogo, Township of Woolwich, County of Waterloo.

Records Available—July 16, 1913, to October 31, 1916.

Drainage Area—550 square miles.

Gauge—Vertical steel staff 0 to 12 feet on the centre pier of bridge. Elevation of zero is 1017.00 feet.

Channel and Control—The channel is straight for about 300 feet above and below the gauging section. The banks are low and liable to overflow. The bed is composed of gravel, and all the water is confined between the abutments of the bridge, except at a very serious flood. In flood stages the banks and bed are liable to shift.

Discharge Measurements—Made from the bridge during high water, and at a permanent low water section located 600 feet upstream during the low water period.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice during the winter season, and measurements are made to determine the winter flow.

Accuracy—The slight shifting of the channel has little affect. The rating curve is well defined, and records are good.

Observer—E. Schinbein, Conestogo.

Discharge Measurements of Grand River near Conestogo in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 10....	Roberts, E.	130	107	1.37	1,018.42	147	.....
1916							
Jan. 7....	"	238	662	2.33	1,020.60	1,539 (a)	.....
" 26....	Cunnington, G..	247	712	2.44	1,020.83	1,735 (b)	.....
Feb. 2....	Roberts, E.	235	612	2.25	1,020.43	1,378 (c)	.....
" 19....	"	135	156	1.10	1,019.00	173 (d)	.....
Mar. 21....	Cunnington, G..	266	1,349	4.03	1,023.33	5,439	.....
Apr. 4....	"	248	809	3.00	1,021.17	2,430	.....
" 4....	"	248	809	2.97	1,021.17	2,401	.....
" 4....	"	248	809	2.96	1,021.17	2,397	.....
May 9....	Roberts, E.	182	356	1.79	1,019.25	634	.....
Oct. 6....	"	118	45	.60	1,017.77	27	.....

(a) Anchor ice at section.

(b) Ice at both sides of section.

(c) Slush at section and ice at left side.

(d) Measurement not taken at regular section; ice at gauge.

Daily Gauge Height and Discharge of Grand River near Conestogo for 1915-6

Drainage Area, 550 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge			
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.	Feet
1	1018.39	147	1019.85	1060	1018.96	335	1022.04	3290	1018.87	150	1024.29	6990	1019.25	575	1019.58	835	1018.46	168	1017.94	49	1017.67	18	1017.89	42	1017.85	37	1017.85	37	1017.85	37	1017.85	37	1017.85	37		
2	1018.37	142	1019.48	755	1019.31	470	1020.54	1500	1018.87	150	1022.33	4010	1019.75	975	1019.64	880	1018.50	180	1017.81	32	1017.71	22	1017.85	37	1017.85	37	1017.85	37	1017.85	37	1017.85	37	1017.85	37		
3	1018.31	125	1019.31	620	1019.52	610	1019.96	975	1018.77	110	1022.08	3660	1020.04	1240	1020.92	2180	1018.42	156	1017.77	28	1017.75	26	1017.89	42	1017.85	37	1017.85	37	1017.85	37	1017.85	37	1017.85	37		
4	1018.33	130	1019.12	485	1019.60	690	1019.46	505	1018.79	110	1021.46	2850	1020.37	1570	1019.67	905	1018.33	130	1017.77	28	1017.75	26	1017.89	42	1017.85	37	1017.85	37	1017.85	37	1017.85	37	1017.85	37		
5	1018.31	125	1018.98	400	1021.17	2160	1018.96	260	1018.71	97	1020.89	2150	1019.87	1080	1020.18	1280	1018.33	130	1017.75	26	1017.64	16	1017.81	32	1017.85	37	1017.85	37	1017.85	37	1017.85	37	1017.85	37		
6	1018.39	147	1019.00	410	1021.46	2520	1018.92	240	1018.77	122	1020.64	1850	1019.58	835	1019.54	800	1018.29	119	1017.71	22	1017.67	18	1017.79	30	1017.79	30	1017.79	30	1017.79	30	1017.79	30	1017.79	30		
7	1018.35	136	1018.96	390	1020.79	1790	1019.12	260	1018.87	150	1020.08	1280	1019.35	650	1019.12	484	1018.29	119	1017.69	20	1017.64	16	1017.81	32	1017.81	32	1017.81	32	1017.81	32	1017.81	32	1017.81	32		
8	1018.35	136	1018.94	380	1020.62	1550	1019.62	260	1018.96	180	1019.94	1150	1019.27	590	1019.54	800	1018.25	109	1017.75	26	1017.67	18	1017.71	22	1017.71	22	1017.71	22	1017.71	22	1017.71	22	1017.71	22		
9	1018.46	168	1018.79	305	1020.23	1110	1019.71	260	1018.98	180	1019.54	800	1019.48	755	1019.75	975	1018.08	71	1017.73	24	1017.67	18	1017.81	32	1017.81	32	1017.81	32	1017.81	32	1017.81	32	1017.81	32		
10	1018.44	162	1018.58	212	1019.83	850	1019.58	310	1019.08	220	1019.62	865	1019.58	835	1020.50	1700	1018.08	71	1017.73	24	1017.64	16	1017.71	22	1017.71	22	1017.71	22	1017.71	22	1017.71	22	1017.71	22		
11	1018.40	150	1018.50	180	1019.92	875	1019.58	360	1018.98	180	1019.83	1050	1019.37	665	1019.62	865	1017.94	49	1017.71	22	1017.62	14	1017.71	22	1017.71	22	1017.71	22	1017.71	22	1017.71	22	1017.71	22		
12	1018.42	156	1018.60	220	1020.02	975	1019.62	360	1018.79	220	1020.52	1720	1019.17	520	1019.48	755	1017.96	51	1017.71	22	1017.67	18	1017.71	22	1017.71	22	1017.71	22	1017.71	22	1017.71	22	1017.71	22		
13	1018.42	156	1018.62	228	1020.69	1600	1019.52	360	1019.08	220	1021.96	3500	1019.04	434	1019.29	605	1017.96	51	1017.73	24	1017.71	22	1017.71	22	1017.71	22	1017.71	22	1017.71	22	1017.71	22	1017.71	22		
14	1018.31	125	1018.56	204	1020.50	1450	1019.46	335	1019.00	180	1023.83	6230	1018.87	345	1019.08	458	1017.94	49	1017.77	28	1017.71	22	1017.94	49	1017.94	49	1017.94	49	1017.94	49	1017.94	49	1017.94	49		
15	1018.37	142	1018.60	220	1020.39	1350	1019.29	310	1018.98	165	1022.37	4070	1019.21	545	1019.08	458	1017.94	49	1017.64	16	1017.67	18	1017.78	30	1017.78	30	1017.78	30	1017.78	30	1017.78	30	1017.78	30		
16	1018.44	162	1018.62	228	1020.04	975	1019.23	285	1019.02	200	1021.08	2380	1019.42	705	1021.00	2280	1017.94	49	1017.75	26	1017.71	22	1017.96	31	1017.96	31	1017.96	31	1017.96	31	1017.96	31	1017.96	31		
17	1018.40	150	1018.67	248	1019.42	540	1019.27	310	1018.94	165	1021.71	3170	1019.56	820	1020.21	1410	1017.94	49	1017.69	20	1017.67	18	1017.99	30	1017.99	30	1017.99	30	1017.99	30	1017.99	30	1017.99	30		
18	1018.37	142	1018.58	212	1019.08	285	1019.17	240	1018.87	150	1021.33	2680	1019.48	755	1020.21	1410	1017.96	51	1017.79	30	1017.73	24	1017.75	26	1017.75	26	1017.75	26	1017.75	26	1017.75	26	1017.75	26		
19	1018.75	285	1018.64	256	1018.83	212	1019.00	170	1018.77	122	1021.25	2580	1019.17	520	1019.83	1050	1017.96	51	1017.69	20	1017.67	18	1017.79	30	1017.79	30	1017.79	30	1017.79	30	1017.79	30	1017.79	30		
20	1020.31	1510	1018.73	275	1018.75	200	1019.00	180	1018.87	150	1021.08	2380	1019.42	705	1021.00	2280	1017.94	49	1017.69	20	1017.67	18	1017.99	30	1017.99	30	1017.99	30	1017.99	30	1017.99	30	1017.99	30		
21	1019.75	975	1018.67	248	1018.79	200	1018.92	136	1018.98	220	1021.27	2600	1018.96	390	1019.25	575	1017.96	51	1017.73	24	1017.67	18	1018.29	119	1018.29	119	1018.29	119	1018.29	119	1018.29	119	1018.29	119		
22	1019.56	820	1018.62	228	1022.87	4390	1018.87	136	1018.96	310	1024.21	6860	1018.87	345	1019.86	390	1018.17	90	1017.69	20	1017.67	18	1018.33	130	1018.33	130	1018.33	130	1018.33	130	1018.33	130	1018.33	130		
23	1019.21	545	1018.69	180	1021.25	2210	1018.87	136	1018.87	260	1022.67	4490	1019.62	865	1018.62	228	1018.00	57	1017.73	24	1017.73	24	1018.21	100	1018.21	100	1018.21	100	1018.21	100	1018.21	100	1018.21	100		
24	1019.21	545	1018.60	136	1020.62	1500	1018.87	136	1018.85	260	1021.08	2380	1019.35	650	1018.75	285	1017.98	54	1017.85	37	1017.71	22	1018.21	100	1018.21	100	1018.21	100	1018.21	100	1018.21	100	1018.21	100		
25	1019.29	605	1018.33	97	1020.83	1760	1018.87	136	1018.89	285	1020.81	2950	1019.00	410	1019.33	635	1018.10	74	1017.75	26	1017.89	42	1018.04	64	1018.04	64	1018.04	64	1018.04	64	1018.04	64	1018.04	64		
26	1019.75	975	1018.46	122	1020.96	1860	1018.83	117	1018.92	370	1020.79	2030	1018.75	285	1018.50	410	1018.00	57	1017.67	18	1017.67	18	1018.04	64	1018.04	64	1018.04	64	1018.04	64	1018.04	64	1018.04	64		
27	1020.60	1810	1018.69	165	1022.08	3290	1018.73	110	1020.54	1740	1020.79	2030	1018.79	305	1018.75	285	1018.00	57	1017.69	20	1017.79	30	1017.87	39	1017.87	39	1017.87	39	1017.87	39	1017.87	39	1017.87	39		
28	1020.94	2210	1018.77	220	1025.46	8470	1018.85	136	1022.08	3660	1020.12	1320	1018.75	285	1018.62	228	1017.96	51	1017.79	30	1017.81	32	1017.87	39	1017.87	39	1017.87	39	1017.87	39	1017.87	39	1017.87	39		
29	1020.52	1720	1018.81	252	1021.08	2040	1018.75	110	1023.29	5380	1019.73	955	1018.69	256	1018.58	212	1017.92	46	1017.69	20	1017.96	51	1017.85	37	1017.85	37	1017.85	37	1017.85	37	1017.85	37	1017.85	37		
30	1020.33	1530	1019.06	360	1020.54	1500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
31	.....	.....	.....	385	1023.92	6020	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Monthly Discharge of Grand River near Conestogo for 1915-6

Drainage Area 550 Square Miles.

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in inches on Drainage Area
November (1915)	2,210	125	538	4.02	.23	.98	1.09
December.. "	1,060	97	312	1.93	.18	.57	.66
January. . (1916)	8,470	200	1,735	15.40	.36	3.15	3.63
February	3,290	110	411	5.98	.20	.75	.81
March.....	7,550	97	970	13.73	.18	1.76	2.03
April.....	6,990	740	2,694	12.71	1.35	4.90	5.47
May.....	2,350	256	730	4.27	.47	1.33	1.53
June.	2,280	196	811	4.15	.36	1.47	1.64
July.....	180	32	76	.33	.06	.14	.16
August.....	49	18	25	.09	.03	.05	.06
September	54	14	24	.10	.03	.04	.04
October.....	130	18	47	.24	.03	.08	.09
The year	8,470	14	696	15.40	.03	1.26	17.29

Grand River at Galt

Location—At the Concession Street bridge, in the City of Galt, Township of North Dumfries, County of Waterloo.

Records Available—July 21, 1913, to October 31, 1916.

Drainage Area—1,360 square miles.

Gauge—Vertical steel staff 0 to 12 feet on first left pier of the bridge. Elevation of zero on gauge is 851.00, which has remained unchanged since established.

Channel and Control—The channel is straight for 1,000 feet above and below the section. The bed is solid rock formation. Residents each year encroach on the natural channel by building up the banks to protect their lots from washing away.

Discharge Measurements—Made from bridge for high stages, and at a permanent wading section 150 feet upstream during low stages.

Winter Flow—Ice slightly affects the relation of gauge height to discharge during the winter, and measurements are made to determine the winter flow. The open-water rating curve is applicable.

Regulation—This section is subject to serious fluctuations in the river stage caused by the operation of the Galt dam situated ¼ mile above.

Accuracy—The rating curve is fairly well defined, and records are good.

Observer—Charles Parker, Galt.

Discharge Measurements of Grand River at Galt in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 16....	Cunnington, G...	142	234	1.60	852.48	375	.....
Dec. 22....	Yeates, W.....	185	662	.66	852.79	437 (a)	.....
1916							
Jan. 5....	Cunnington, G...	194	984	1.82	854.46	1,794 (b)	.....
" 21....	Yeates, W.....	187	746	1.00	853.33	751 (c)	.....
Feb. 17....	"	186	680	.99	852.93	600 (d)	.....
" 23....	Roberts, E.	180	609	.94	852.72	573 (e)	.....
Mar. 1....	Yeates, W.....	180	606	.79	852.64	478 (f)	.....
" 30....	Cunnington, G...	214	2,393	5.96	861.25	14,256 (g)	.....
Apr. 1....	Yeates, W.....	114	2,350	6.87	860.98	16,145	.....
" 6....	Cunnington, G...	204	1,247	2.50	855.84	3,122	.....
" 6....	"	204	1,247	2.51	855.83	3,131	.....
Oct. 12....	Roberts, E.	138	192	.99	852.96	189	.....

- (a) Ice at both sides of section; slush ice in stream.
- (b) Section partly ice-covered.
- (c) Thin ice on control and at gauge; slush ice in stream.
- (d) Ice above and below section.
- (e) Probably affected by heavy wind down stream.
- (f) Ice measurement.
- (g) Grass probably interferes with meter.

Daily Gauge Height and Discharge of Grand River at Galt for 1915-6

Drainage Area 1,360 Square Miles

	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	852.55	345	854.64	1890	852.94	515	859.00	9250	853.00	430	860.67	15080	854.17	1460	855.35	2650	852.87	530	851.86	142	851.83	136	852.02	174
2	852.53	335	854.27	1550	853.29	725	856.37	4010	852.64	394	859.04	9380	854.25	1530	854.54	1800	852.73	448	851.86	140	851.81	132	852.14	202
3	852.62	382	854.06	1360	853.87	1110	854.92	2170	852.67	412	858.08	6940	854.67	1910	857.25	5340	852.68	418	851.85	140	851.77	124	852.07	184
4	852.52	330	853.69	1040	854.19	1390	853.87	1190	852.52	330	857.08	5070	855.69	1930	856.08	3600	852.62	382	851.87	144	851.67	104	852.02	174
5	852.60	370	853.46	885	855.62	2870	853.62	995	852.45	320	856.21	3780	855.42	2740	855.50	2840	852.52	330	851.85	140	851.68	106	852.08	186
6	852.62	382	853.37	830	856.08	3460	853.15	700	852.44	296	855.81	3240	854.58	1830	855.04	2300	852.51	325	851.76	122	851.71	112	852.02	174
7	852.51	325	853.23	750	856.02	3390	853.00	610	852.58	360	853.17	2450	854.12	1420	853.46	304	851.73	116	851.73	116	851.79	128	851.98	166
8	852.60	370	853.28	780	855.21	2380	853.44	875	852.58	360	854.60	1850	853.96	1270	854.67	1910	852.35	265	851.77	124	851.78	126	851.92	154
9	852.75	460	853.19	725	854.79	1930	852.57	271	852.44	296	854.56	1810	854.02	1330	854.75	1990	852.44	296	851.81	132	851.78	126	851.88	146
10	852.62	382	852.96	585	854.77	1910	852.61	284	852.58	360	854.19	1480	854.10	1400	856.62	4370	852.37	271	851.81	132	851.68	106	851.97	164
11	852.56	350	852.39	277	854.52	1690	852.73	355	852.87	530	854.27	1550	854.27	1550	855.29	2580	852.37	271	851.92	154	851.71	112	852.14	202
12	852.64	394	852.21	225	854.54	1710	852.69	316	852.67	412	854.87	2120	854.44	1710	854.69	1930	852.33	259	851.85	140	851.83	136	851.97	164
13	852.61	375	852.69	424	854.98	2130	852.82	382	852.37	271	857.20	5260	853.83	1160	854.50	1760	852.29	247	851.84	138	851.77	124	852.08	186
14	852.54	340	852.37	271	856.00	2150	852.28	186	852.58	360	858.90	8970	853.58	965	854.21	1500	852.17	211	851.78	126	851.73	116	852.06	182
15	852.68	418	852.29	247	855.08	2240	852.78	360	853.25	400	859.08	9510	854.00	1310	854.29	1570	852.21	223	851.81	132	851.71	112	852.08	186
16	852.70	430	852.48	312	854.46	1450	852.82	382	852.69	424	856.87	4740	854.67	1910	855.92	3390	852.12	196	851.67	104	851.74	118	852.10	190
17	852.67	412	852.64	394	854.00	1050	852.92	442	852.75	460	856.92	4820	854.75	1990	854.92	3390	852.08	186	851.80	130	851.66	102	852.09	188
18	852.62	382	852.89	545	853.58	780	853.00	490	852.69	424	857.18	5230	854.69	1930	855.37	2670	852.00	170	851.87	144	851.69	108	852.06	182
19	852.96	585	852.81	496	853.50	730	853.19	605	852.54	340	856.00	3490	854.25	1530	854.96	2220	852.08	186	851.88	146	851.73	116	852.21	223
20	855.42	2740	852.96	585	853.62	800	853.14	575	852.54	340	855.23	2510	854.04	1350	854.50	1760	852.10	190	851.85	140	851.95	160	852.52	330
21	854.96	2220	852.92	560	853.37	830	853.08	540	852.83	370	856.71	4920	853.77	1110	854.12	1420	852.06	182	851.82	134	851.81	132	852.75	460
22	854.33	1610	852.98	600	855.50	2840	852.83	388	852.46	304	857.58	5920	853.64	1010	853.75	1090	851.96	162	851.82	134	851.83	136	852.75	460
23	853.85	1180	852.75	460	858.62	8220	852.75	345	852.56	350	859.25	10060	854.33	1610	853.46	885	852.48	312	851.90	150	851.82	134	852.59	365
24	853.73	1070	852.64	394	856.21	3730	852.85	400	852.50	320	856.96	4880	854.79	2030	853.27	770	852.37	211	851.83	136	851.69	108	852.52	330
25	853.71	1060	852.64	394	856.21	3780	852.71	325	852.29	247	855.96	3440	854.17	1460	853.17	1460	852.37	211	851.86	142	851.64	98	852.51	325
26	853.71	1060	852.71	436	855.79	3220	852.67	308	852.67	412	856.12	3660	853.62	995	854.21	1500	852.23	229	851.85	140	851.61	92	852.42	288
27	855.50	2840	852.75	460	856.92	4820	852.64	296	853.79	1120	857.90	4940	853.56	950	853.46	885	852.12	196	851.73	116	851.84	138	852.39	247
28	856.33	3950	852.77	472	864.33	15710	852.60	280	856.83	4690	855.67	3060	854.33	1610	853.46	885	852.12	196	851.73	116	851.84	138	852.39	247
29	855.60	2970	853.00	610	857.58	5920	852.79	365	860.46	14300	854.96	2220	854.71	1950	853.23	750	851.94	158	851.77	124	852.08	186	852.17	211
30	855.83	3270	853.17	710	856.42	4080	.....	.....	.....	.....	851.92	19700	854.54	1800	855.75	3160	853.00	610	851.83	136	852.10	190	852.23	229
31	.....	.....	853.12	680	858.67	8350	.....	.....	.....	.....	861.42	17850	.....	.....	856.87	4740	.....	.....	851.82	134	.....	.....	852.25	255

Monthly Discharge of Grand River at Galt for 1915-6

Drainage Area, 1,360 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November. (1915)	3,950	325	1,045	2.90	.24	.77	.86
December. "	1,890	223	643	1.39	.16	.47	.54
January .. (1916)	13,710	515	3,029	10.08	.38	2.23	2.57
February.....	9,250	186	954	6.80	.14	.70	.76
March.....	19,700	247	2,167	14.49	.18	1.59	1.83
April.....	15,080	1,480	4,792	11.09	1.09	3.52	3.93
May.....	4,740	950	1,705	3.49	.70	1.25	1.44
June.....	5,340	610	2,052	3.93	.45	1.51	1.68
July.....	530	148	256	.39	.11	.19	.22
August.....	154	104	134	.11	.08	.10	.12
September	190	92	126	.14	.07	.09	.10
October.....	460	146	231	.34	.11	.17	.20
The year.....	19,700	92	1,424	14.49	.07	1.05	14.29

Grand River at Glen Morris

Location—At the Glen Morris bridge, in the Village of Glen Morris, Township of South Dumfries, County of Brant.

Records Available—Discharge measurements from August, 1912, to October 31, 1916.
Daily gauge heights, July 21, 1913, to October 31, 1916.

Drainage Area—1,390 square miles.

Gauge—Vertical steel staff 0 to 6 feet on a post and 6 to 12 feet on a tree on left bank.
Elevation of the zero on gauge is 801.00, which has remained unchanged since established.

Channel and Control—The channel is straight for 1,000 feet above and below the section. The bed of the river is composed of gravel and boulders, and banks are permanent. The bed and control is shifting under high water conditions.

Discharge Measurements—Made from bridge during the high water stages, and at permanent wading section located 150 feet upstream during the lower water periods.

Winter Flow—This section is seriously affected by ice which usually floods, forming as many as three or four layers of ice with water between them. Measurements are made during the winter months to determine the winter flow.

Regulation—This section is subject to fluctuations in the river stage, due to the storing of water, during the night and at week ends, by the Galt dam, located eight miles above.

Accuracy—Owing to poor natural conditions, the liability of the control to shift and back water caused by ice, the records cannot be considered better than fair.

Observer—Alfred Forbes, Glen Morris P.O.

Discharge Measurements of Grand River at Glen Morris in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 6....	Yeates, W.	265	404	1.02	802.52	415	.....
Dec. 21....	"	222	315	1.81	802.83	571 (a)	.....
1916							
Jan. 4....	Cunnington, G... ..	281	770	2.78	804.06	2,137 (b)	.....
Feb. 17....	"	266	537	1.57	803.27	843 (c)	.....
" 24....	Roberts, E.	266	438	1.30	802.83	589 (d)	.....
" 25....	Yeates, W.	266	495	1.22	802.87	606 (e)	.....
Mar. 1....	"	266	544	.98	803.23	537	.....
" 16....	"	266	471	1.33	803.12	626	.....
Apr. 1....	"	410	2,669	7.47	809.19	19,942	.....
" 8....	Cunning on,	281	829	2.74	804.08	2,274	.....
" 8....	"	281	801	2.73	804.04	2,185	.....
July 5....	Yeates, W.	271	468	1.18	802.79	553	.....
Oct. 12....	Roberts, E.	171	167	1.15	802.37	192	.....

(a) Ice at both sides of section.

(b) Ice at piers.

(c) Ice on section half-way across.

(d) Section partly ice-covered.

(e) Ice measurement.

Monthly Discharge of Grand River at Glen Morris for 1915-6

Drainage Area, 1,390 Square Miles

Month	Discharge in Second-feet			Drainage in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	5,670	276	1,602	4.08	.20	1.15	1.28
December.. "	2,270	360	726	1.63	.26	.52	.60
January .. (1916)	15,110	665	3,305	10.87	.48	2.38	2.74
February	9,140	420	1,504	6.58	.30	1.08	1.16
March.....	18,840	390	2,315	13.55	.28	1.67	1.93
April.....	16,420	1,700	5,312	11.81	1.22	3.82	4.26
May.....	5,880	1,300	2,245	4.23	.94	1.61	1.86
June	6,180	900	2,463	4.45	.65	1.77	1.97
July.....	855	288	489	.62	.21	.35	.40
August	402	320	347	.29	.23	.25	.29
September	426	268	336	.31	.19	.24	.27
October.....	855	304	453	.62	.22	.33	.38
The year	18,840	268	1,752	13.55	.19	1.26	17.15

Grand River at York

Location—At the highway bridge in the Village of York, Township of Oneida, County of Haldimand.

Records Available—June 25, 1913, to October 31, 1916.

Drainage Area—2,280 square miles.

Gauge—Vertical steel staff 0 to 6 feet on the first pier from left abutment and 6 to 12 feet on the left abutment. The elevation of zero is 593.00, and has remained unchanged since established.

Channel and Control—The flow is confined between the abutments of the bridge at all stages. The bed of the river is well protected, but shifting during flood stages. A partly demolished dam about 200 feet downstream affects flow, especially at low stages. Part of this old dam is washed out at each flood period.

Discharge Measurements—Taken from the highway bridge, and at a permanent low water section located 800 feet above during the low water period.

Floods—No floods of a serious nature have occurred here since the spring of 1912, when the dam below the bridge was wrecked, the water cutting around the right abutment, greatly increasing the width of the channel. Village residents state the water rose to a gauge height of 606 feet, which would mean approximately 100,000 second feet.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice, and measurements are made to determine the winter flow.

Regulation—The nearest dam is at Caledonia, five miles above. The intermittent operation of the mills causes daily fluctuations in the gauge heights.

Accuracy—The conditions of flow are good, except for the fluctuations caused through the Caledonia Mills. Well-defined rating curves have been established, and the records can be considered good. Semi-daily gauge heights will not give a good representative mean.

Observer—Fred. Brown, York P.O.

Discharge Measurements of Grand River at York in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 18....	Cunnington, G..	293	492	1.51	593.87	746	.....
1916							
Jan. 10....	"	387	2,229	2.11	596.79	4,706 (a)	.....
" 22....	Yeates, W.	382	2,653	1.34	598.02	3,543 (a)	.....
Apr. 1....	Roberts, E.	400	3,444	6.37	600.00	21,937 (b)	.....
" 1....	"	400	3,364	6.32	599.75	21,256	.....
" 3....	"	382	2,610	4.59	597.92	11,970	.....
" 3....	"	378	2,418	4.20	597.33	10,168	.....
" 4....	"	378	2,229	3.68	596.92	8,213	.....
" 4....	"	378	2,229	3.44	596.83	7,660	.....
July 6....	"	341	1,177	.67	593.94	789	.....

(a) Heavy ice piled on crest of dam causing backwater.

(b) Control changing.

Monthly Discharge of Grand River at York for 1915-6

Drainage Area, 2,280 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off Depth in Inches on Drainage Area
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	
November (1915)	6,360	590	1,669	2.80	.26	.73	.81
December "	5,060	900	1,815	2.22	.39	.80	.92
January (1916)	21,420	1,340	7,565	9.39	.59	3.32	3.83
February	21,180	1,500	3,167	9.29	.66	1.39	1.50
March	27,100	900	4,430	11.89	.39	1.94	2.24
April	21,800	3,260	8,369	9.56	1.43	3.67	4.09
May	8,790	2,640	3,972	3.86	1.16	1.74	2.01
June	7,810	1,400	4,056	3.43	.61	1.78	1.99
July	1,370	448	689	.60	.20	.30	.35
August	474	288	373	.21	.13	.16	.18
September	448	208	324	.20	.09	.14	.16
October	1,150	276	550	.50	.12	.24	.28
The year	27,100	208	3,076	11.89	.09	1.35	18.38

Boston Creek near York

Location—At the second highway bridge known as Anderson's Bridge, above the junction with the Grand River, between Concessions 5 and 6, Township of Oneida, County of Haldimand.

Records Available—June 23, 1913, to May 31, 1915, at first highway bridge. At Anderson's Bridge, June 1, 1915, to August 31, 1916.

Drainage Area—125 square miles.

Gauge—Vertical steel staff 0 to 9 feet, attached to downstream side of left abutment. Elevation of zero on gauge is 600.00.

Channel and Control—The channel is straight for 400 feet above and below the gauging section. The river bed is composed of slab rock and is not shifting under normal conditions. The flow passes between the two abutments of the bridge at all stages.

Discharge Measurements—Made from the bridge during freshet stages and from a permanent wading section 100 feet above, during the low water period.

Winter Flow—Relation of gauge height to discharge is affected by ice and measurements are made to determine the winter flow.

Accuracy—Records previous to June 1st, 1915, are not very reliable on account of being affected by backwater from the Grand River. Insufficient records to define rating curve at high stages. Gauge reading discontinued after August 31, 1916.

Observer—H. J. Anderson, Caledonia.

Discharge Measurements of Boston Creek near York in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 18....	Cunnington, G...	42	21	.92	600.75	19	.....
1916							
Apr. 3....	Roberts, E	79	206	2.13	602.29	438	.....
" 3....	"	79	206	2.14	602.29	440	.....
" 4....	"	79	190	1.65	602.00	314	.....
" 4....	"	79	190	1.74	602.00	330	.....

Daily Gauge Height and Discharge of Boston Creek near York for 1915-6
Drainage Area, 125 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge	Gauge Ht.		Dis-charge			
	Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.		Feet	Sec-ft.				
1	1600.75	22	600.98	49	601.62	66	603.33	850	601.35	27	602.79	635	601.21	84	602.37	468	600.81	28	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
2	2600.77	24	601.04	58	602.58	320	602.54	535	601.25	22	602.58	550	601.14	72	602.50	520	600.77	24	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
3	600.75	22	601.04	58	603.04	400	602.21	404	601.17	16	602.50	520	101.10	66	602.54	535	600.75	22	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	
4	4600.75	22	601.00	52	602.83	360	602.12	368	601.17	22	602.04	336	601.21	84	602.37	468	600.75	22	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	
5	5600.69	15	600.92	42	603.62	620	602.17	388	601.42	39	601.67	191	601.33	106	602.29	436	600.75	22	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	
6	600.75	22	600.85	33	603.37	540	602.50	240	601.60	59	601.50	144	601.21	84	602.67	590	600.73	19	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	
7	7600.73	19	600.87	35	603.42	600	601.96	304	601.54	52	601.54	154	601.29	98	602.17	388	600.73	19	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	
8	8600.75	22	600.85	33	603.37	540	602.50	240	601.60	59	601.50	144	601.21	84	602.67	590	600.73	19	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	
9	9600.75	22	600.87	35	603.21	380	602.58	200	601.54	66	601.42	126	601.10	66	602.29	400	600.69	15	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	
10	10600.73	19	601.04	58	602.37	200	602.33	170	601.52	66	601.42	126	601.10	66	602.29	400	600.69	15	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	
11	11600.67	13	601.00	52	601.96	185	601.96	100	601.50	66	601.44	131	601.58	165	601.62	176	600.69	15	600.64	11	600.64	11	600.64	11	600.64	11	600.64	11	600.64	11	600.64	11	600.64	11	600.64	
12	12600.67	13	600.96	47	601.96	185	601.96	100	601.50	66	601.44	131	601.58	165	601.62	176	600.69	15	600.64	11	600.64	11	600.64	11	600.64	11	600.64	11	600.64	11	600.64	11	600.64	11	600.64	
13	13600.75	22	600.85	33	602.17	280	601.85	66	601.67	82	603.00	720	601.39	119	601.62	176	600.69	15	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	
14	14600.75	22	600.87	22	602.25	280	601.85	66	601.71	52	601.75	91	603.04	735	601.52	149	601.62	13	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	
15	15600.81	28	600.92	16	602.75	480	601.71	52	601.75	91	603.04	735	601.52	149	601.62	176	600.69	15	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
16	16600.73	19	600.87	16	602.87	600	601.62	33	601.83	110	602.42	488	601.79	236	601.83	252	600.67	13	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
17	17600.71	17	600.87	12	603.29	680	601.46	27	601.77	110	602.17	388	601.92	288	601.67	191	600.67	13	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
18	18600.75	22	600.85	12	603.58	780	601.29	22	601.75	110	602.08	352	601.87	268	601.37	115	600.67	13	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
19	19600.94	44	600.92	16	603.50	760	601.25	22	601.75	110	601.85	260	601.69	197	601.29	98	600.67	13	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
20	20601.04	58	601.10	33	603.12	620	601.29	33	601.75	110	601.62	176	601.33	106	601.17	77	600.71	17	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	13	600.67	
21	21601.58	165	601.14	52	602.92	560	601.44	46	601.67	110	601.52	420	601.25	91	601.17	77	600.69	15	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	
22	22601.54	154	601.29	39	602.75	480	601.42	33	601.62	110	602.75	620	601.71	204	601.04	58	600.69	15	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
23	23601.42	126	601.08	39	602.92	520	601.33	27	601.58	110	602.62	570	601.71	204	601.04	58	600.69	15	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
24	24601.31	102	601.31	39	602.42	360	601.21	22	601.58	110	602.08	352	601.83	252	600.98	49	600.71	17	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
25	25601.19	80	601.17	52	601.83	252	601.12	16	601.58	105	601.79	236	601.46	135	600.83	42	600.69	15	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
26	26601.12	69	601.42	82	601.67	191	601.08	7	602.46	505	601.67	191	601.46	135	600.83	31	600.67	13	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	9	600.62	
27	27601.00	52	601.42	82	601.75	220	601.06	12	603.67	990	601.58	165	601.33	106	600.87	35	600.64	11	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	
28	28601.00	52	601.54	91	602.00	320	601.19	22	603.96	1100	601.46	134	601.31	102	600.83	31	600.62	9	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
29	29601.00	52	601.79	110	602.29	436	601.37	33	603.96	1100	601.46	134	601.31	102	600.83	31	600.62	9	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
30	30601.00	52	602.00	121	601.87	268	601.37	33	603.54	935	601.33	106	603.17	790	600.83	31	600.62	9	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	6	600.58	
31	.....	.....	602.08	91	602.79	236	.....	.....	603.25	820	.....	.....	602.83	650	.....	.....	600.62	9	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60	7	600.60

Monthly Discharge of Boston Creek near York for 1915-6

Drainage Area, 125 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	165	13	46	1.32	.10	.37	.41
December "	121	12	50	.97	.10	.40	.46
January (1916)	780	66	403	6.24	.53	3.22	3.71
February	850	7	161	6.80	.06	1.29	1.39
March	1,170	16	240	9.36	.13	1.92	2.21
April	735	106	308	5.88	.85	2.46	2.74
May	790	66	181	6.32	.53	1.45	1.67
June	590	31	234	4.72	.25	1.87	2.09
July	28	9	16	.22	.07	.13	.15
August	13	6	8	.10	.05	.06	.07
September							
October							
The period	1,170	7	164	9.36	.05	1.31	14.90

NOTE.—Gauge reading discontinued from September 1st, 1916.

Conestogo River at St. Jacob's

Location—At the highway bridge in the Village of St. Jacob's, Township of Woolwich, County of Waterloo.

Records Available—July 16, 1913, to August 31, 1916.

Drainage Area—305 square miles.

Gauge—Vertical*steel staff 0 to 3 feet on pile near left bank and 3 to 12 on the right abutment. Elevation of zero on the gauge is 1057.00, which has remained unchanged since established.

Channel and Control—The channel is straight for about 500 feet above and 1,000 feet below the gauging section. The banks are low, shifting, and liable to overflow. Fine gravel forms the bed of the stream and is not very permanent. The disposal of garbage from the bridge affects the area of the section to some extent.

Discharge Measurements—Made from the bridge during high stages, and at a permanent wading section located 800 feet down stream during the low water period.

Winter Flow—The relation of gauge height to discharge is affected by ice during the winter season.

Regulation—The Snyder mill is located just above this bridge, and its intermittent operation causes variations in the river stage. During the dry season it is possible, when the dam is closed and flash boards on, to hold back practically all the water for a period of 24 hours.

Accuracy—The constantly changing channel and control has necessitated the use of a number of rating curves, and therefore the records cannot be considered very reliable.

Observer—A. Niebergall, St. Jacob's.

Gauge reading discontinued after August 31, 1916.

Discharge Measurements of Conestogo River at St. Jacob's in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 10....	Roberts, E.	65	42	1.35	1,058.14	57	.....
1916							
Mar. 31....	Cunnington, G...	166	949	2.88	1,061.46	2,738	..... ..
Apr. 4....	" "	165	768	1.63	1,060.33	1,256	.....
" 4....	" "	165	768	1.54	1,060.21	1,181	.....
" 4....	" "	165	751	1.62	1,060.21	1,216	.....
May 9....	Roberts, E.	160	558	.64	1,059.00	359	.....

Daily Gauge Height and Discharge of Conestogo River at St. Jacobs for 1915-6

Drainage Area 305 Square Miles

Day	November			December			January			February			March			April			May			June			July			August			September			October		
	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet	Gauge Ht.	Dis-charge	Feet			
1	1058.12	59	1059.46	570	1058.96	220	1061.67	2950	1058.25	55	1061.71	3000	1058.56	173	1058.79	252	1058.19	73	1057.77	20	1057.77	20	1057.77	20	1057.77	20	1057.77	20	1057.77	20	1057.77	20	1057.77	20	1057.77	20
2	1058.04	46	1059.29	475	1059.31	340	1060.27	1280	1058.37	75	1061.52	2770	1058.29	98	1060.33	1350	1058.14	63	1057.56	9	1057.56	9	1057.56	9	1057.56	9	1057.56	9	1057.56	9	1057.56	9	1057.56	9	1057.56	9
3	1058.04	46	1059.00	340	1060.52	1310	1059.08	275	1056.33	65	1060.44	1480	1059.54	92	1059.87	875	1058.08	52	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6
4	1058.29	98	1058.71	224	1060.60	1430	1058.64	125	1058.39	75	1059.98	970	1058.92	304	1059.12	3394	1058.00	40	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6
5	1058.35	112	1058.55	224	1062.17	2750	1058.50	100	1058.21	55	1059.39	530	1058.81	259	1059.02	349	1058.04	46	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6
6	1058.08	52	1058.60	185	1060.46	1490	1058.33	65	1058.21	55	1059.39	530	1058.67	210	1058.71	224	1057.96	36	1057.46	5	1057.46	5	1057.46	5	1057.46	5	1057.46	5	1057.46	5	1057.46	5	1057.46	5	1057.46	5
7	1057.92	32	1058.46	143	1060.79	1310	1058.33	65	1058.37	75	1059.21	435	1058.46	143	1058.56	173	1057.98	38	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6
8	1058.08	52	1058.48	149	1060.62	1090	1058.31	65	1058.37	75	1059.14	403	1059.02	349	1058.89	291	1057.85	26	1057.42	5	1057.42	5	1057.42	5	1057.42	5	1057.42	5	1057.42	5	1057.42	5	1057.42	5	1057.42	5
9	1058.17	69	1058.42	131	1060.23	855	1058.33	65	1058.31	55	1059.04	358	1059.10	385	1059.39	530	1057.87	28	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6
10	1058.06	49	1058.40	125	1060.83	1430	1058.32	100	1058.37	75	1058.96	322	1058.56	173	1060.37	1390	1057.96	36	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6
11	1058.08	52	1058.29	98	1059.92	1490	1058.29	55	1058.35	75	1058.58	179	1058.73	230	1059.37	520	1057.83	24	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4
12	1058.10	55	1058.21	78	1059.02	220	1058.31	55	1058.46	88	1059.28	470	1058.37	118	1059.23	445	1057.73	18	1057.54	9	1057.54	9	1057.54	9	1057.54	9	1057.54	9	1057.54	9	1057.54	9	1057.54	9	1057.54	9
13	1057.96	36	1058.17	69	1061.69	295	1058.12	40	1058.48	88	1061.52	2770	1058.44	137	1059.25	455	1057.73	18	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6	1057.48	6
14	1058.10	55	1058.21	78	1060.50	340	1058.29	295	1058.46	88	1062.04	3400	1058.52	161	1059.04	358	1057.64	13	1057.44	5	1057.44	5	1057.44	5	1057.44	5	1057.44	5	1057.44	5	1057.44	5	1057.44	5	1057.44	5
15	1058.12	59	1058.29	98	1060.39	295	1058.46	88	1058.44	88	1060.46	1500	1058.35	167	1059.21	435	1057.69	16	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4
16	1058.14	63	1058.10	55	1059.04	255	1058.44	88	1058.46	88	1060.46	1500	1058.35	112	1059.33	496	1057.67	15	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3
17	1058.12	59	1058.17	69	1059.42	318	1058.42	88	1058.44	88	1059.87	870	1058.14	63	1059.87	875	1057.62	12	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4
18	1058.08	52	1058.31	102	1059.08	295	1058.39	75	1058.42	88	1059.67	710	1058.48	149	1060.50	1550	1057.60	11	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3
19	1059.33	275	1058.27	92	1058.83	255	1058.37	65	1058.37	75	1060.09	1030	1058.29	98	1060.50	1550	1057.60	11	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3
20	1059.71	480	1058.37	118	1059.75	238	1058.35	65	1058.44	88	1060.42	1450	1058.23	82	1059.33	496	1058.54	167	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3
21	1059.60	362	1058.35	112	1062.79	2750	1058.35	65	1058.50	100	1060.08	1070	1058.27	92	1059.12	394	1058.94	313	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3
22	1059.60	220	1058.33	108	1061.87	1790	1058.44	88	1058.56	112	1062.83	4350	1058.46	143	1059.23	445	1058.46	143	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3	1057.37	3
23	1059.71	255	1058.42	100	1060.25	480	1058.35	65	1058.44	88	1060.42	1450	1058.23	82	1059.33	496	1058.54	167	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3
24	1058.87	185	1058.46	100	1060.62	660	1058.35	65	1058.44	88	1060.42	1450	1058.23	82	1059.33	496	1058.54	167	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3
25	1058.96	340	1058.29	65	1060.62	660	1058.35	65	1058.44	88	1060.42	1450	1058.23	82	1059.33	496	1058.54	167	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3	1057.35	3
26	1060.42	1090	1058.29	65	1060.96	1670	1058.37	75	1059.14	403	1059.48	585	1058.17	69	1058.96	322	1057.89	29	1057.33	3	1057.33	3	1057.33	3	1057.33	3	1057.33	3	1057.33	3	1057.33	3	1057.33	3	1057.33	3
27	1061.06	2220	1058.46	88	1061.08	2220	1058.46	88	1061.08	2220	1058.46	88	1061.08	2220	1058.46	88	1061.08	2220	1058.46	88	1061.08	2220	1058.46	88	1061.08	2220	1058.46	88	1061.08	2220	1058.46	88	1061.08	2220	1058.46	88
28	1060.85	1970	1058.62	125	1063.46	5120	1058.46	88	1063.46	5120	1058.46	88	1063.46	5120	1058.46	88	1063.46	5120	1058.46	88	1063.46	5120	1058.46	88	1063.46	5120	1058.46	88	1063.46	5120	1058.46	88	1063.46	5120	1058.46	88
29	1060.21	1210	1058.60	112	1063.08	4650	1058.35	75	1063.94	5080	1059.81	820	1058.46	143	1058.21	77	1057.77	20	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4	1057.39	4
30	1059.37	520	1058.62	125	1061.54	2800	.....	.....	.....	.....	1063.08	4650	1059.37	520	1060.67	1750	1058.23	82	1057.79	21	1056.44	5	1056.44	5	1056.44	5	1056.44	5	1056.44	5	1056.44	5	1056.44	5	1056.44	5
31	.....	.....	1058.60	125	1061.92	3250	.....	.....	.....	.....	1062.87	4390	.....	.....	1059.42	545	.....	.....	1057.81	23	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6	1057.46	6

Monthly Discharge of Conestogo River at St. Jacobs for 1915-6

Drainage Area 305 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	2,220	32	339	7.28	.10	1.11	1.24
December. "	510	55	147	1.87	.18	.48	.55
January .. (1916)	5,120	220	1,379	16.79	.72	4.52	5.21
February	2,950	40	224	9.67	.13	.73	.79
March	5,680	55	732	18.62	.18	2.40	2.77
April	4,350	179	1,497	14.26	.59	4.91	5.48
May	1,750	63	234	5.74	.21	.77	.89
June.....	1,550	77	474	5.08	.25	1.55	1.73
July	313	11	50	1.03	.04	.16	.18
August	20	2	5	.07	.01	.02	.02
September.....							
October							
The period.....	5,680	2	507	18.62	.01	1.66	18.82

Gauge reading discontinued from September 1st, 1916.

Fairchild's Creek near Onondaga

Location—At the highway bridge called Howell's Bridge, lot 16, concession 3, Township of Onondaga, County of Brant.

Records Available—June 28, 1913, to August 31, 1916.

Drainage Area—115 square miles.

Gauge—Vertical steel staff 0 to 12 feet on left abutment of bridge. Elevation of zero is 621.00.

Channel and Control—Clay and silt decidedly shifting. This section is affected by Grand River backwater during the freshet period.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—The relation of gauge height to discharge is affected by ice, and measurements are made to determine the winter discharge.

Accuracy—The records for low flows are good. There are not sufficient records available to define rating curve at intermediate and high stages.

Observer—Gertrude Ludlow, Cainsville P.O.

Gauge readings discontinued after August 31, 1916.

Discharge Measurements of Fairchild's Creek near Onondaga in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
Nov. 2....	Yeates, W.	46	26	.83	622.06	21 (a)	.....
Mar. 27....	Roberts, E.	78	426	1.89	629.13	866 (b)	.....
July 3....	Yeates, W,	47	28	.96	622.14	27	.....

(a) Control has changed since last high water.

(b) Backwater from ice jam.

Daily Gauge Height and Discharge of Fairchild's Creek near Onondaga for 1915-6

Drainage Area 115 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.	Gauge Ht. Feet	Dis- charge Sec.-ft.
1	622.06	27	622.48	88	622.10	31	630.87	1770	622.21	22	629.62	1520	622.77	146	623.52	296	622.09	30	621.84	12	.....	.....	.....	.....
2	622.08	29	622.37	68	622.94	180	627.08	1010	622.25	26	628.08	1210	622.77	146	622.85	162	622.08	29	621.84	12	.....	.....	.....	.....
3	622.04	26	622.35	64	624.44	480	624.92	575	622.21	22	625.69	730	622.89	170	622.98	188	622.08	29	621.86	13	.....	.....	.....	.....
4	622.04	26	622.31	57	623.67	326	624.50	492	622.17	22	624.08	408	623.50	292	622.83	158	622.09	30	621.86	13	.....	.....	.....	.....
5	622.04	26	622.42	77	625.23	640	624.00	392	622.17	22	623.67	326	623.25	242	622.69	130	622.04	26	621.85	12	.....	.....	.....	.....
6	622.04	26	622.25	48	629.92	1580	623.73	338	622.17	22	623.67	326	623.00	192	622.58	108	622.04	26	621.87	13	.....	.....	.....	.....
7	622.04	26	622.27	51	629.79	1550	623.42	262	622.27	26	623.50	292	622.92	176	622.58	108	622.01	23	621.85	12	.....	.....	.....	.....
8	622.02	24	622.23	44	629.04	1400	623.21	192	622.48	31	623.50	292	622.87	166	622.42	396	622.00	22	651.85	12	.....	.....	.....	.....
9	622.04	26	622.29	54	627.42	1080	622.89	132	622.64	64	623.67	326	622.89	170	623.08	208	622.00	22	621.85	12	.....	.....	.....	.....
10	622.04	26	622.46	84	626.31	855	622.71	92	622.98	142	623.83	358	622.85	162	622.81	154	622.00	22	621.85	12	.....	.....	.....	.....
11	622.02	24	622.25	48	625.94	780	622.71	102	622.89	132	623.67	326	623.19	230	623.02	196	622.00	22	621.85	12	.....	.....	.....	.....
12	622.04	24	622.10	31	625.25	640	622.64	73	622.81	112	623.67	326	622.98	188	622.81	154	622.00	22	621.92	16	.....	.....	.....	.....
13	622.06	27	622.12	33	627.87	1170	622.54	55	622.73	102	623.87	366	622.73	138	622.67	126	621.96	19	621.92	16	.....	.....	.....	.....
14	622.04	26	622.00	22	628.00	1190	622.48	48	622.81	132	627.75	1140	622.69	130	622.54	100	621.96	19	621.87	13	.....	.....	.....	.....
15	622.01	23	622.00	22	626.50	890	622.42	42	622.96	152	628.12	1220	624.31	454	622.60	112	621.95	18	621.87	13	.....	.....	.....	.....
16	622.00	22	621.96	19	626.50	890	622.37	36	622.96	152	625.02	595	625.00	592	622.60	112	621.93	17	621.87	13	.....	.....	.....	.....
17	622.06	27	621.98	21	624.23	438	622.43	48	622.75	112	624.52	496	623.69	330	622.52	96	621.97	20	621.84	12	.....	.....	.....	.....
18	622.06	27	622.06	27	623.62	316	622.42	42	622.54	92	624.81	555	623.33	258	622.52	96	621.92	16	621.85	12	.....	.....	.....	.....
19	622.12	33	622.14	35	623.25	242	622.46	48	622.39	55	623.75	342	622.89	170	622.58	108	621.94	18	621.84	12	.....	.....	.....	.....
20	622.79	150	622.17	39	623.23	238	622.42	42	622.31	42	623.90	372	622.81	154	622.56	104	621.92	16	621.87	13	.....	.....	.....	.....
21	622.81	154	622.12	33	623.08	208	622.39	36	622.25	36	624.00	392	622.71	134	622.46	84	621.94	18	621.87	13	.....	.....	.....	.....
22	622.62	116	622.08	26	626.00	792	622.31	26	622.25	31	625.52	695	622.67	126	622.39	71	621.94	18	621.94	18	.....	.....	.....	.....
23	622.46	84	622.04	26	628.04	1200	622.25	31	622.29	31	627.04	1000	625.58	708	622.31	57	621.92	16	621.87	13	.....	.....	.....	.....
24	622.37	68	622.06	27	628.92	1380	622.31	31	622.29	42	624.58	510	624.10	412	622.29	54	621.92	16	621.92	16	.....	.....	.....	.....
25	622.37	68	622.14	35	626.75	940	622.35	31	622.42	64	623.69	330	622.98	188	622.48	88	621.89	14	621.87	13	.....	.....	.....	.....
26	622.35	64	622.10	31	625.64	720	622.27	26	624.29	450	623.44	280	622.64	120	622.50	92	621.89	14	621.86	13	.....	.....	.....	.....
27	622.36	66	622.12	33	625.73	740	622.27	26	629.12	1420	623.75	342	622.75	142	622.35	64	621.89	14	621.89	14	.....	.....	.....	.....
28	622.50	92	622.17	35	628.08	1210	622.29	26	630.75	1740	623.10	212	623.37	266	622.23	46	621.89	14	621.87	13	.....	.....	.....	.....
29	622.58	108	622.14	39	628.58	1310	622.21	22	633.00	2190	622.98	188	623.23	238	622.15	36	621.87	14	621.87	13	.....	.....	.....	.....
30	622.58	108	622.08	29	624.87	565	.....	.....	634.00	2390	622.87	166	626.06	804	622.12	33	621.87	14	621.87	13	.....	.....	.....	.....
31	.....	.....	622.08	29	628.12	1220	.....	.....	631.54	1900	.....	.....	625.33	660	.....	.....	621.87	14	621.86	13	.....	.....	.....	.....

Monthly Discharge of Fairchild's Creek near Onondaga for 1915-6

Drainage Area, 115 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	154	22	52	1.34	.19	.45	.50
December "	88	19	41	.77	.17	.36	.42
January.. (1916)	1,580	31	813	13.47	.27	7.07	8.15
February	1,770	22	208	15.39	.19	1.81	1.96
March	2,390	22	380	20.78	.19	3.30	3.80
April	1,520	166	521	13.21	1.44	4.53	5.05
May	804	120	268	6.99	1.04	2.33	2.69
June	396	33	125	3.44	.29	1.09	1.22
July	30	14	20	.26	.12	.17	.20
August	18	12	13	.16	.10	.11	.13
September .....	.....	.....	.....	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....
The period	2,390	12	245	20.78	.10	2.12	24.05

Gauge reading discontinued from September 1st, 1916.

Galt Creek at Galt

Location—At the Kerr Street Bridge in the City of Galt, Township of North Dumfries, County of Waterloo.

Records Available—July 9, 1913, to August 31, 1916.

Drainage Area—45 square miles.

Gauge—Vertical steel staff 0 to 9 feet on the right abutment of bridge. Elevation of zero on gauge is 893.00, which has remained unchanged since established.

Channel and Control—The channel is straight for 500 feet above and below section. The river bed and banks are both practically permanent. It is bounded on both sides by the G.T.R. and C.P.R.

Discharge Measurements—Made from the upstream side of the bridge at all stages.

Winter Flow—The relation of gauge height to discharge is affected by ice during the winter months, and measurements are made to determine the winter flow.

Accuracy—The rating curve is fairly well defined, and the records can be classed as good.

Observer—Charles Parker, Galt.

Gauge readings discontinued after August 31, 1916.

Discharge measurements of Galt Creek at Galt in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Dec. 21....	Yeates, W....	18	9	2.13	893.79	19 (a)	.....
1916							
Apr. 6....	Cunnington, G...	24	35	2.78	894.17	98	.....
" 6....	"	24	36	2.69	894.17	96	.....
" 6....	"	24	36	2.88	894.17	104	.....

(a) Ice on section; ice jam below section.

Daily Gauge Height and Discharge of Galt Creek at Galt for 1915-6

Drainage Area 45 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.	Feet	Sec-ft.
1	893.43	18	893.75	45	894.06	40	894.58	171	893.54	12	894.92	239	893.67	37	894.29	117	893.46	20	893.30	12	.....	.....	.....	.....
2	893.44	18	893.56	27	894.19	45	894.56	167	893.56	14	894.79	213	893.89	61	894.12	91	893.42	17	893.27	11	.....	.....	.....	.....
3	893.45	19	893.58	29	894.31	50	894.44	145	893.48	10	894.46	148	894.00	74	893.96	69	893.46	20	893.25	11	.....	.....	.....	.....
4	893.44	18	893.54	26	894.33	56	894.58	137	893.54	12	894.12	91	894.08	85	893.75	35	893.46	20	893.27	11	.....	.....	.....	.....
5	893.44	18	893.46	20	894.39	68	894.77	119	893.46	10	894.12	91	894.04	80	893.69	39	893.44	18	893.31	12	.....	.....	.....	.....
6	893.44	18	893.52	24	894.44	74	895.37	119	893.42	10	894.04	80	893.85	69	893.71	41	893.43	18	893.29	12	.....	.....	.....	.....
7	893.43	18	893.54	26	894.46	74	895.37	119	893.42	10	893.87	58	893.81	51	894.04	80	893.39	16	893.33	13	.....	.....	.....	.....
8	893.43	18	893.51	23	894.35	68	895.69	96	893.48	12	893.75	45	893.69	39	894.10	88	893.39	16	893.33	13	.....	.....	.....	.....
9	893.35	14	893.52	24	894.21	56	895.83	96	893.46	9	893.75	45	893.77	47	894.02	77	893.51	23	893.33	13	.....	.....	.....	.....
10	893.36	14	893.89	61	894.14	45	895.96	96	893.44	8	893.71	41	893.73	43	893.92	64	893.44	18	893.39	16	.....	.....	.....	.....
11	893.40	16	893.94	40	894.14	45	895.71	96	893.54	12	893.81	51	893.69	39	893.81	51	893.52	24	893.33	13	.....	.....	.....	.....
12	893.48	21	893.96	31	894.19	45	895.54	96	893.73	22	894.21	105	893.67	37	893.67	37	893.58	29	893.42	17	.....	.....	.....	.....
13	893.45	19	893.85	22	894.48	56	895.54	96	893.73	22	894.58	171	893.71	41	893.77	47	893.52	24	893.27	11	.....	.....	.....	.....
14	893.46	19	893.77	16	894.67	62	895.04	96	893.60	14	894.62	179	893.81	51	894.04	85	893.35	14	893.28	11	.....	.....	.....	.....
15	893.50	22	893.73	12	894.64	62	895.04	96	893.44	12	894.37	132	894.10	88	893.92	64	893.35	14	893.25	11	.....	.....	.....	.....
16	893.48	21	893.64	12	894.50	45	895.04	96	893.44	12	894.33	124	894.12	91	894.08	85	893.35	14	893.25	11	.....	.....	.....	.....
17	893.42	17	893.71	14	894.37	31	895.00	96	893.44	10	894.33	132	894.21	105	894.04	80	893.31	12	893.27	11	.....	.....	.....	.....
18	893.44	18	893.64	12	894.12	26	894.92	96	893.44	10	894.25	111	893.98	72	893.92	64	893.35	15	893.25	11	.....	.....	.....	.....
19	893.53	25	893.64	12	894.04	26	894.64	96	893.39	10	894.08	85	893.77	45	893.87	58	893.37	15	893.25	11	.....	.....	.....	.....
20	893.77	47	898.96	26	893.77	39	894.37	74	893.50	14	894.08	85	893.77	45	893.79	49	893.37	15	893.27	11	.....	.....	.....	.....
21	893.96	65	893.81	19	893.69	39	894.04	40	893.54	26	893.89	80	893.87	58	893.73	43	893.31	12	893.33	13	.....	.....	.....	.....
22	893.55	56	893.75	14	894.48	152	894.17	50	893.60	31	894.04	80	893.87	58	893.48	21	893.27	11	893.46	20	.....	.....	.....	.....
23	893.83	54	893.71	12	894.75	205	893.87	56	893.73	43	894.31	121	894.08	85	893.48	21	893.27	11	893.46	20	.....	.....	.....	.....
24	893.69	39	893.81	16	894.71	147	893.69	16	894.08	85	894.17	98	894.08	85	893.48	21	893.27	11	893.46	20	.....	.....	.....	.....
25	893.67	37	893.85	16	894.46	198	893.73	19	894.00	74	894.21	105	894.12	91	893.62	33	893.31	12	893.31	12	.....	.....	.....	.....
26	893.58	29	894.04	22	894.21	105	893.67	16	894.08	85	894.08	85	893.83	54	893.60	31	893.31	12	893.31	12	.....	.....	.....	.....
27	893.60	30	894.02	16	894.25	111	893.71	19	894.04	85	894.17	98	893.96	69	893.62	33	893.29	12	893.23	10	.....	.....	.....	.....
28	893.59	30	893.96	16	894.75	205	893.92	22	894.08	88	894.08	88	893.96	69	893.62	33	893.29	12	893.23	10	.....	.....	.....	.....
29	893.68	38	894.06	22	894.77	209	893.62	14	895.42	339	894.04	80	894.25	111	893.56	27	893.27	11	893.27	11	.....	.....	.....	.....
30	893.73	43	894.23	31	894.46	148	.....	.....	895.37	329	893.85	56	894.37	132	893.52	24	893.27	11	893.25	11	.....	.....	.....	.....
31	.....	.....	894.04	19	894.50	156	.....	.....	395.17	289	.....	.....	894.52	160	.....	.....	893.31	12	893.27	11	.....	.....	.....	.....

Monthly Discharge of Galt Creek at Galt for 1915-6

Drainage Area. 45 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inche on Drainage Area
November (1915)	69	14	27	1.53	.31	.60	.67
December. "	61	12	23	1.36	.27	.51	.59
January .. (1916)	209	22	86	4.64	.49	1.91	2.20
February	171	14	81	3.80	.31	1.80	1.94
March.....	339	8	64	7.53	.18	1.42	1.64
April.....	239	41	103	5.31	.91	2.29	2.55
May.....	160	37	71	3.56	.82	1.58	1.82
June	117	21	55	2.60	.47	1.22	1.36
July.....	29	10	16	.64	.22	.36	.42
August.....	20	10	12	.44	.22	.27	.31
September.....	.....	.....	.....	.....	.....	.....	.....
October.....	.....	.....	.....	.....	.....	.....	.....
The period	339	8	54	7.53	.18	1.20	13.61

Gauge reading discontinued from September 1st, 1916.

Irvine River near Salem

Location—At the highway bridge known as Watt's Bridge about $1\frac{1}{2}$ miles above Salem on the blind line between the 11th and 12th concessions, lot 14, Township of Nichol, County of Wellington.

Records Available—Old section, July to October, 1913; present section, November 1, 1913, to August 31, 1916.

Drainage Area—67 square miles.

Gauge—Vertical steel staff 0 to 9 feet attached to the centre pier of bridge. Elevation of zero on gauge is 1297.00, which has remained unchanged since established.

Channel and Control—The river bed and banks are composed of solid rock, and consequently permanent.

Discharge Measurements—During the flood of 1914 an attempt was made to obtain a meter reading from the bridge, but owing to a velocity of about 14 feet per second it was found impossible to keep the meter in the water. During the low stages a permanent wading section is located 100 feet upstream.

Winter Flow—The relation of gauge height to discharge is somewhat affected when ice is present at the station. Meter measurements are made during that period to determine the winter discharge.

Accuracy—The open channel rating curve is well defined up to gauge height 1289.50 feet, and records of discharge up to 400 sec. feet are good.

Observer—Annie Barber, Salem.

Gauge reading discontinued after August 31, 1916.

Discharge Measurements of Irvine River near Salem in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 10....	Roberts, E	44	15	1.00	1,297.42	15 (a)	.....
1916							
Apr. 1....	Cunnington, G..	77	134	7.60	1,299.08	1,019	.....
May 9....	Roberts, E.	47	28	2.43	1,297.77	68	.....

(a) Rocks affect accuracy of reading.

Daily Gauge Height and Discharge of Irvine River near Salem for 1915-6

Drainage Area, 67 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	1297.54	321	1298.06	27	1297.93	8	1299.17	470	1297.45	8	1299.04	959	1297.83	79	1297.84	81	1297.39	16	1297.08	2	.....	.....	.....	.....
2	1297.51	28	1298.00	27	1298.17	5	1298.75	120	1297.43	8	1298.71	480	1298.00	120	1297.87	87	1297.37	15	1297.08	2	.....	.....	.....	.....
3	1297.48	25	1297.98	27	1298.50	72	1298.50	107	1297.42	8	1298.33	234	1298.17	175	1298.04	132	1297.37	15	1297.08	2	.....	.....	.....	.....
4	1297.49	26	1297.96	27	1298.25	54	1298.75	94	1297.42	8	1298.33	234	1298.21	188	1297.87	87	1297.35	14	1297.08	2	.....	.....	.....	.....
5	1297.50	27	1297.96	27	1298.17	39	1299.12	94	1297.42	8	1298.33	234	1297.99	117	1298.04	132	1297.34	13	1297.06	2	.....	.....	.....	.....
6	1297.50	27	1297.93	27	.....	39	1299.25	83	1297.42	8	1298.12	157	1297.81	74	1297.96	110	1297.27	9	1297.04	1	.....	.....	.....	.....
7	1297.50	27	1297.85	27	.....	39	1299.08	94	1297.50	10	1297.42	19	1297.62	45	1297.89	92	1297.25	8	1297.04	1	.....	.....	.....	.....
8	1297.50	27	1297.74	27	.....	39	1299.00	72	1297.50	10	1297.42	19	1297.62	42	1297.87	87	1297.25	8	1297.04	2	.....	.....	.....	.....
9	1297.49	26	1297.69	27	.....	39	1298.96	54	1297.50	10	1297.42	19	1297.67	50	1298.12	157	1297.25	8	1297.06	2	.....	.....	.....	.....
10	1297.44	21	1297.65	10	.....	39	1298.85	39	1297.56	10	1298.00	120	1297.87	87	1298.17	175	1297.22	6	1297.06	2	.....	.....	.....	.....
11	1297.40	17	1298.37	10	.....	39	1298.77	27	1297.50	10	1298.08	144	1298.00	120	1298.10	150	1297.17	4	1297.05	2	.....	.....	.....	.....
12	1297.39	16	1298.42	10	1298.25	27	1298.62	17	1297.50	10	1298.17	176	1297.82	76	1297.97	112	1297.17	4	1297.05	2	.....	.....	.....	.....
13	1297.37	15	1297.75	10	1298.44	27	1298.31	10	1297.50	10	1298.17	176	1297.82	76	1297.97	112	1297.17	4	1297.05	2	.....	.....	.....	.....
14	1297.35	13	1297.75	10	1298.54	27	1298.17	10	1297.50	10	1298.17	176	1297.82	76	1297.97	112	1297.17	4	1297.05	2	.....	.....	.....	.....
15	1297.44	21	1297.75	10	1298.52	27	1298.04	10	1297.50	10	1300.46	3302	1297.69	52	1297.94	164	1297.17	4	1297.05	2	.....	.....	.....	.....
16	1297.48	25	1297.62	10	1298.67	17	1297.87	10	1297.50	10	1298.83	615	1297.83	79	1301.08	2720	1297.17	4	1297.06	2	.....	.....	.....	.....
17	1297.52	29	1297.64	10	1299.17	10	1297.64	10	1297.50	10	1298.75	520	1297.85	83	1299.04	950	1297.17	4	1297.06	2	.....	.....	.....	.....
18	1297.54	32	1297.71	16	1299.17	10	1297.58	10	1297.50	10	1298.52	333	1297.87	87	1298.27	210	1297.17	4	1297.04	2	.....	.....	.....	.....
19	1298.12	46	1297.67	10	1299.04	10	1297.58	10	1297.50	10	1298.31	224	1297.80	72	1298.04	132	1297.17	4	1297.02	1	.....	.....	.....	.....
20	1298.48	54	1297.63	10	1298.92	22	1297.54	10	1297.58	14	1299.00	880	1297.75	63	1297.9	100	1297.17	4	1297.01	1	.....	.....	.....	.....
21	1298.04	54	1297.63	10	1298.96	39	1297.50	10	1297.54	14	1298.46	298	1297.62	42	1297.79	70	1297.24	7	1297.00	1	.....	.....	.....	.....
22	1298.00	39	1297.58	10	1299.75	575	1297.50	10	1297.50	10	1300.17	2870	1297.74	61	1297.62	42	1297.19	5	1297.00	1	.....	.....	.....	.....
23	1297.98	27	1297.58	10	1299.25	385	1297.50	10	1297.50	10	1298.96	810	1297.85	83	1297.49	26	1297.17	4	1297.00	1	.....	.....	.....	.....
24	1297.94	17	1297.58	10	1298.67	242	1297.50	10	1297.50	10	1298.42	276	1297.81	56	1297.69	52	1297.17	4	1297.00	1	.....	.....	.....	.....
25	1298.00	22	1297.62	10	1298.75	265	1297.50	10	1297.50	10	1298.27	210	1297.71	56	1297.87	87	1297.17	4	1297.06	2	.....	.....	.....	.....
26	1298.46	27	1297.67	10	1298.75	265	1297.50	10	1297.56	27	1299.04	950	1297.60	39	1297.71	56	1297.17	4	1297.06	2	.....	.....	.....	.....
27	1298.83	320	1297.69	10	1299.58	880	1297.50	10	1298.83	615	1298.89	695	1297.67	63	1297.61	40	1297.12	3	1297.08	2	.....	.....	.....	.....
28	1298.77	265	1297.75	10	1300.50	3430	1297.50	8	1299.54	1800	1298.33	234	1297.75	63	1297.53	31	1297.09	2	1297.08	2	.....	.....	.....	.....
29	1298.69	150	1297.83	10	1299.62	1930	1297.50	8	1300.19	2500	1297.81	74	1297.75	63	1297.47	24	1297.08	2	1297.08	2	.....	.....	.....	.....
30	1298.42	94	1297.92	10	1299.62	1930	.....	.....	1299.96	2510	1297.62	42	1298.33	234	1297.42	19	1297.08	2	1297.08	2	.....	.....	.....	.....
31	.....	.....	1297.87	10	1299.79	1220	.....	.....	1299.14	1120	.....	.....	1297.98	114	.....	.....	1297.08	2	1297.06	2	.....	.....	.....	.....

Monthly Discharge of Irvine River near Salem for 1915-6

Drainage Area 67 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	320	13	54	4.78	.19	.81	.90
December "	27	10	15	.40	.15	.22	.25
January (1916)	3,430	5	461	51.19	.07	5.67	6.54
February	470	8	50	7.01	.12	.75	.81
March	2,900	8	297	43.28	.12	4.43	5.11
April	3,362	10	560	50.18	.15	8.36	9.33
May	234	39	86	3.49	.58	1.28	1.48
June	2,720	19	213	40.60	.28	3.18	3.55
July	16	2	6	.24	.03	.09	.10
August	2	1	2	.03	.02	.03	.03
September .....	.....	.....	.....	.....	.....	.....	.....
October .....	.....	.....	.....	.....	.....	.....	.....
The period	3,430	1	166	51.19	.02	2.49	28.10

Gauge reading discontinued from September 1st, 1916.

Nith River near Canning

Location—At the highway bridge 200 feet upstream from the Grand Trunk Railway bridge, lot 2, concession 2, Township of Blenheim, County of Oxford, 1 mile from the Village of Canning.

Records Available—July 5, 1913, to October 31, 1916.

Drainage Area—365 square miles.

Gauge—Vertical steel staff 0 to 3 feet on pile in centre of stream and 3 to 12 feet on left abutment. Elevation of zero on gauge is 799.00, which has remained unchanged since established.

Channel and Control—Slightly shifting bed; both banks permanent under ordinary conditions. Control only affected by ice jams during the early freshet.

Discharge Measurements—Made from the bridge during high-water stages, and from a permanent wading section 100 feet above during the low-water period.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice during the winter, and measurements are made to determine the winter flow.

Regulation—Fluctuations of a serious nature occur in the river stage at this section, caused through the intermittent operation of the milling plant at Canning, 1½ miles above.

Accuracy—On account of stage variations, these records are not very reliable.

Observer—Lewis Baker, Canning P.O.

Discharge Measurements of Nith River near Canning in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 5....	Yeates, W.....	93	76	1.72	801.21	131	.....
" 23....	Cunnington, G...	95	139	3.30	802.21	459	.....
Dec. 20....	Yeates, W.....	95	142	1.39	802.54	197 (a)	.....
1916							
Jan. 26....	"	119	388	3.30	803.76	1,277 (b)	.....
" 31....	Roberts, E.	125	517	4.03	804.75	2,083 (c)	.....
Mar. 28....	Yeates, W.....	126	568	4.03	805.12	2,287 (d)	.....
Apr. 2....	Roberts, E.....	125	567	4.22	805.10	2,396	.....
" 7....	Cunnington, G...	114	263	2.24	802.62	588	.....
" 7....	"	114	263	2.45	802.62	645	.....
" 7....	"	114	263	2.23	802.67	587	.....
July 4....	Yeates, W.....	92	75	1.63	801.07	122	.....

- (a) Ice on control.
- (b) Ice below section.
- (c) Ice on both sides of section.
- (d) Ice on sides below section.

Monthly Discharge of Nith River near Canning for 1915-6

Drainage Area 365 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square-mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	1,540	104	417	4.22	.28	1.14	1.27
December. “	910	170	270	2.49	.47	.74	.85
January.. (1916)	3,240	230	1,239	8.88	.63	3.39	3.91
February	2,430	335	571	6.79	.92	1.56	1.68
March.....	4,900	610	1,076	13.42	1.67	2.95	3.40
April	3,160	398	1,148	8.66	1.09	3.15	3.51
May.....	2,940	376	798	8.05	1.03	2.19	2.52
June	1,700	292	683	4.66	.80	1.87	2.09
July	307	61	131	.84	.17	.36	.42
August	116	67	103	.32	.18	.28	.32
September	158	57	92	.43	.16	.25	.28
October	212	63	124	.58	.17	.34	.39
The year.....	4,900	57	554	13.42	.16	1.52	20.69

Speed River near Guelph

Location—At Caraher's highway bridge above the junction of the Speed and Eramosa Rivers and $3\frac{3}{4}$ miles from the City of Guelph, Township of Guelph, County of Wellington.

Records Available—October 27, 1913, to October 31, 1916.

Drainage Area—77 square miles.

Gauge—Vertical steel staff 0 to 12 feet, one on each abutment of bridge. Elevation of zero on each gauge is 1126.00, which has remained unchanged since established.

Channel and Control—The channel is straight for 250 feet above and 500 feet below the gauging section. During flood stages the control and banks are liable to shift, as the bed is composed of loose gravel. One channel exists at all stages.

Discharge Measurements—Made from the bridge and from a permanent low water section 300 feet down stream.

Winter Flow—The relation of gauge height to discharge is seriously affected by ice during the winter season, and measurements are taken during that period to determine the winter flow.

Regulation—A small mill is operated one mile and a half upstream. Slight fluctuations are caused only in the dry season, and are hardly noticeable at the gauge.

Accuracy—The open channel rating curve is fairly well defined for flows up to 500 second feet, the discharge for low flows being considered good.

Observer—Hugh Caraher, Guelph.

Discharge Measurements of Speed River near Guelph in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 9....	Roberts, E.....	45	25	.84	1,128.14	21	.....
1916							
April 5....	Cunnington, G ..	70	162	1.70	1,129.14	276	.....
" 5....	" ..	70	162	1.63	1,129.14	264	.....
" 5....	" ..	70	162	1.63	1,129.17	265	.....
May 10....	Roberts, E.....	56	57	1.44	1,128.58	82	.....
Oct. 6....	Yeates, W.....	49	13	.26	1,127.98	3	.....

Daily Gauge Height and Discharge of Speed River near Guelph for 1915-6
Drainage Area, 77 Square Miles.

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht. Feet	Dis-charge Sec.-ft.	Gauge Ht. Feet	Dis-charge Sec.-ft.
1	1128.33	47	1128.50	74	1128.75	43	1131.37	635	1128.83	50	1130.29	710	1128.64	103	1128.87	163	1128.25	37	1127.83	4	1127.83	4	1127.92	8
2	1128.17	28	1128.50	43	1129.04	74	1131.12	515	1128.89	66	1129.67	463	1128.75	130	1128.96	191	1128.17	28	1127.83	4	1127.92	8	1127.92	8
3	1128.08	19	1128.46	31	1129.12	84	1130.56	395	1128.94	74	1128.87	463	1129.00	204	1130.08	623	1128.17	28	1127.75	2	1127.92	8	1127.92	8
4	1128.08	19	1128.46	26	1129.17	94	1130.21	257	1129.00	84	1128.83	152	1129.12	246	1129.14	254	1128.17	28	1127.67	2	1127.92	8	1127.92	8
5	1128.17	28	1128.42	26	1129.29	117	1129.62	204	1128.87	74	1128.96	191	1128.85	158	1129.04	218	1128.17	28	1127.67	2	1127.92	8	1127.92	8
6	1128.17	28	1128.42	26	1129.75	239	1129.58	143	1128.83	66	1128.96	191	1128.71	120	1128.87	163	1128.08	19	1127.67	2	1127.92	8	1127.92	8
7	1128.17	28	1128.39	21	1129.75	239	1129.29	117	1129.00	84	1128.96	191	1128.58	94	1128.69	115	1128.08	19	1127.58	1	1127.92	8	1127.92	8
8	1128.21	32	1128.39	21	1129.75	239	1129.29	117	1129.00	84	1128.75	130	1128.62	99	1128.67	110	1128.08	19	1127.58	1	1127.83	4	1127.92	8
9	1128.17	28	1128.54	31	1129.54	188	1128.96	74	1129.00	84	1128.75	130	1128.60	94	1128.67	110	1128.08	19	1127.71	2	1127.83	4	1127.92	8
10	1128.14	25	1128.54	31	1129.42	157	1129.17	106	1129.00	84	1128.67	110	1128.60	94	1128.54	82	1128.17	28	1127.83	4	1127.83	4	1127.92	8
11	1128.17	28	1128.50	26	1129.37	117	1128.96	74	1129.08	94	1128.67	110	1128.96	191	1128.62	99	1128.12	23	1127.92	8	1127.83	4	1127.92	8
12	1128.21	32	1128.56	31	1129.46	172	1128.92	66	1129.00	84	1128.98	198	1128.67	110	1128.62	99	1128.08	19	1127.92	8	1127.83	4	1127.92	8
13	1128.25	37	1128.56	31	1130.06	276	1128.75	43	1129.08	94	1129.58	427	1128.60	94	1128.58	90	1128.08	19	1127.92	8	1127.83	4	1127.92	8
14	1128.25	37	1128.58	31	1129.83	204	1128.83	57	1129.04	84	1130.33	725	1128.54	82	1128.50	74	1128.08	19	1127.92	8	1127.83	4	1127.96	11
15	1128.21	32	1128.54	26	1129.79	172	1128.83	57	1129.08	94	1129.71	479	1128.83	152	1128.46	67	1128.08	13	1127.92	8	1127.83	4	1128.08	19
16	1128.17	28	1128.58	31	1129.64	143	1128.83	57	1129.08	94	1129.00	479	1128.83	152	1128.46	67	1128.08	13	1127.92	8	1127.83	4	1128.08	19
17	1128.25	37	1128.54	26	1129.54	117	1128.83	57	1129.00	74	1129.77	505	1128.55	158	1128.52	78	1128.12	23	1127.92	8	1127.83	4	1128.08	19
18	1128.21	32	1128.62	31	1129.46	94	1128.79	50	1129.14	94	1129.30	315	1128.77	135	1128.54	82	1128.04	16	1127.92	8	1127.83	4	1128.08	19
19	1128.42	60	1128.67	37	1129.42	84	1128.79	50	1128.92	74	1128.96	191	1128.58	90	1128.50	74	1128.00	13	1127.92	8	1127.83	4	1128.46	67
20	1129.00	204	1128.67	37	1129.35	74	1128.79	50	1129.08	94	1129.54	411	1128.52	99	1128.50	74	1128.00	13	1127.92	8	1127.83	4	1128.46	67
21	1128.50	130	1128.62	31	1129.44	117	1128.79	50	1129.08	94	1129.54	411	1128.52	99	1128.50	74	1128.00	13	1127.92	8	1127.83	4	1128.46	67
22	1128.50	130	1128.67	43	1132.12	315	1128.67	37	1129.00	84	1130.29	710	1128.62	99	1128.44	64	1128.04	16	1127.92	8	1127.83	4	1128.46	67
23	1128.52	78	1128.79	57	1132.33	375	1128.73	50	1128.96	74	1129.75	495	1129.08	232	1128.12	23	1128.00	13	1128.06	8	1127.83	4	1128.35	50
24	1128.48	71	1128.54	31	1131.67	204	1128.75	50	1128.96	74	1129.75	495	1129.08	232	1128.12	23	1128.00	13	1128.06	8	1127.83	4	1128.35	50
25	1128.46	67	1128.42	21	1131.19	143	1128.87	66	1128.96	94	1129.00	265	1128.85	158	1128.33	47	1128.00	13	1127.96	8	1127.83	4	1128.37	52
26	1128.71	120	1128.54	21	1131.00	130	1128.87	66	1128.96	94	1129.00	265	1128.85	158	1128.33	47	1128.00	13	1127.96	8	1127.83	4	1128.37	52
27	1128.79	140	1128.92	74	1131.33	204	1128.83	55	1129.62	443	1128.96	191	1128.46	67	1128.58	90	1128.00	13	1127.92	8	1127.83	4	1128.08	19
28	1129.00	204	1128.92	74	1131.33	204	1128.83	55	1129.62	443	1129.02	241	1128.67	110	1128.44	64	1127.87	6	1127.92	8	1127.83	4	1128.08	19
29	1128.83	152	1128.96	84	1132.17	475	1128.92	66	1131.33	1130	1129.02	241	1128.67	110	1128.44	64	1127.87	6	1127.92	8	1127.83	4	1128.08	19
30	1128.75	125	1128.92	74	1131.39	204	1128.87	57	1133.08	1830	1128.83	152	1128.50	74	1128.29	42	1127.87	6	1127.92	8	1127.92	8	1128.04	16
31	.....	.....	1128.87	66	1130.37	74	.....	.....	1133.31	1920	1128.69	115	1129.87	545	1128.29	42	1127.83	4	1127.92	8	1127.92	8	1128.00	13
	.....	.....	1128.87	50	1132.32	915	.....	.....	1131.52	1200	.....	.....	1129.35	335	.....	.....	1127.83	4	1127.92	8	.....	.....	1128.00	13

Monthly Discharge of Speed River near Guelph for 1915-6

Drainage Area, 77 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	204	19	66	2.65	.25	.86	.96
December “	84	21	39	1.09	.27	.51	.59
January (1916)	915	43	196	11.86	.56	2.55	2.94
February	635	37	124	8.25	.48	1.61	1.74
March	1,920	50	283	24.94	.65	3.68	4.24
April	725	110	295	9.42	1.43	3.83	4.27
May	545	74	145	7.08	.96	1.88	2.17
June	625	23	116	8.12	.30	1.51	1.68
July	37	4	17	.48	.05	.22	.25
August	13	1	7	.23	.01	.09	.10
September	8	4	5	.10	.05	.06	.07
October	67	8	21	.87	.10	.27	.31
The year	1,920	1	109	2,494	.01	1.42	19.33

Speed River at Hespeler

Location—At a point 100 feet below the jail, which adjoins the power house, in the Town of Hespeler, Township of Waterloo, County of Waterloo.

Records Available—Discharge measurements from July 10, 1913, to October 31, 1916. Daily gauge heights from October 23, 1913, to October 31, 1916.

Drainage Area—250 square miles.

Gauge—Vertical steel staff 0 to 12 feet on jail wall adjoining power house. The elevation of zero on the gauge is 935.00.

Channel and Control—Straight for about 300 feet above and below the gauging section. Loose gravel forms the bed of this stream, which is decidedly shifting. The banks are low, and overflow when the water raises 2 feet above normal. Weeds at the control and in channel have a decided effect at the gauging section.

Discharge Measurements—Made from a permanent wading section 100 feet below the gauge during the low stages, and the dam 400 feet above will be used as a weir during the flood season.

Winter Flow—The relation of gauge height to discharge is somewhat affected by the presence of ice for a short period during the winter season.

Regulation—A dam 400 ft. above this section causes serious fluctuations in the river stage during the low water period.

Accuracy—Owing to the shifting bed and the presence of weeds at and below section, greatly interfering with the metering of stream, these records can only be classed as fair.

Observer—W. D. Scott, Hespeler.

Discharge Measurements of Speed River at Hespeler in 1915-6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 16....	Cunnington, G.	90	99	1.92	936.43	152	.....
Dec. 23....	Yeates, W	86	80	1.04	936.21	83 (a)	.....
1916							
Jan. 8....	Roberts, E....	102	182	2.40	937.31	436	.....
" 21....	Yeates, W	97	150	1.58	936.92	238 (b)	.....
Feb. 17....	"	93	131	1.38	936.68	181 (b)	.....
Mar. 1....	Cunnington, G.	94	105	1.27	936.42	132 (c)	.....
May 10....	Roberts, E....	100	166	2.27	937.08	378	.....

(a) Section has been badly scoured; large quantities of gravel have been taken from bed of stream.

(b) Ice-covered below section.

(c) Section partly ice-covered.

Daily Gauge Height and Discharge of Speed River at Hespeler for 1915-6

Drainage Area, 250 Square Miles

Day	November		December		January		February		March		April		May		June		July		August		September		October	
	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge	Gauge Ht.	Dis-charge
	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.	Feet	Sec.-ft.
1	936.48	150	937.05	330	936.48	150	939.98	2190	936.62	186	939.83	2080	937.23	405	938.42	1090	936.64	191	936.31	109	936.23	94	936.00	57
2	936.39	128	937.12	358	936.69	205	938.39	1070	936.50	155	939.23	1660	937.25	415	937.73	670	936.60	180	936.31	109	936.19	86	936.23	94
3	936.42	135	936.98	305	936.81	244	937.64	615	936.52	160	938.69	1280	937.21	395	938.96	1470	936.60	180	936.35	118	936.04	63	936.27	101
4	936.42	135	936.71	230	936.83	250	937.19	386	936.52	160	938.37	1060	937.12	358	938.73	1310	936.52	160	936.33	114	935.98	55	936.25	98
5	936.48	150	936.58	175	937.06	334	937.04	326	936.56	170	938.04	855	937.10	350	938.27	700	936.52	160	936.23	94	936.23	94	936.25	98
6	936.44	140	936.50	155	937.33	455	937.00	275	936.54	165	937.62	600	937.10	350	937.79	905	936.52	160	935.96	52	936.27	101	936.23	94
7	936.35	118	936.48	150	937.52	550	936.79	202	936.64	191	937.39	485	937.23	405	937.62	600	936.46	145	935.89	44	936.27	101	936.23	94
8	935.42	135	936.50	155	937.42	500	936.71	186	936.60	180	937.23	405	937.10	350	937.54	560	936.42	135	936.34	116	936.21	90	936.08	69
9	936.46	145	936.39	128	937.19	386	936.73	186	936.50	155	937.17	378	937.12	358	937.44	510	936.50	155	936.35	118	936.21	90	936.25	98
10	936.39	128	936.37	123	937.23	405	936.79	208	936.48	150	937.06	334	937.12	358	937.33	455	936.52	160	936.29	105	936.04	63	936.27	101
11	936.29	105	936.37	123	937.10	350	936.73	194	936.48	150	937.37	475	937.14	364	937.44	510	936.42	135	936.31	109	936.27	101	936.25	98
12	936.39	128	936.31	109	936.96	296	936.87	240	936.50	155	938.42	1090	937.12	358	937.29	435	936.39	128	936.31	109	936.30	107	936.25	98
13	936.33	114	936.37	123	937.56	570	937.08	310	936.50	155	938.42	1090	937.12	358	937.17	378	936.37	123	936.02	60	936.27	101	936.25	98
14	936.35	118	936.35	118	937.08	342	937.06	310	936.48	150	938.58	1210	937.14	364	937.12	358	936.35	118	936.31	109	936.25	98	936.27	101
15	935.39	128	936.35	118	937.08	342	937.06	310	936.48	150	938.58	1210	937.14	364	937.12	358	936.35	118	936.31	109	936.25	98	936.27	101
16	936.46	145	936.39	128	937.19	310	936.96	258	936.39	128	938.37	1060	937.14	364	937.06	334	936.35	118	936.23	94	936.29	105	936.23	94
17	936.42	135	936.46	145	937.60	292	936.75	194	936.62	140	938.35	1040	937.29	435	937.14	364	936.30	128	936.27	101	935.96	52	936.23	94
18	936.35	118	936.52	160	937.52	257	936.73	194	936.64	191	938.39	1070	937.44	510	937.14	364	936.37	123	936.23	94	936.25	98	936.25	98
19	936.64	191	936.48	150	937.44	258	936.71	194	936.64	191	938.37	1060	937.33	455	937.10	350	936.33	114	936.23	94	936.25	98	936.25	98
20	937.21	395	936.48	150	937.02	240	936.71	194	936.64	191	938.37	1060	937.33	455	937.10	350	936.33	114	936.23	94	936.25	98	936.25	98
21	937.19	386	936.46	145	936.92	240	936.96	296	936.50	155	938.06	865	937.23	405	937.02	318	936.31	109	936.00	57	936.29	105	936.25	98
22	937.10	350	936.31	109	937.06	334	936.71	194	936.64	191	938.37	1060	937.33	455	937.10	350	936.33	114	936.23	94	936.29	105	936.25	98
23	936.87	265	946.37	123	938.14	915	936.58	175	936.37	123	938.35	1040	937.17	378	936.92	282	936.21	90	936.31	109	936.21	90	936.04	63
24	936.75	224	936.39	128	937.85	740	936.50	155	936.30	107	938.67	1270	937.08	342	937.19	386	936.31	109	936.23	94	935.83	39	936.27	101
25	936.75	224	936.37	123	937.77	690	936.50	155	936.31	109	938.35	1040	937.08	342	937.29	425	936.25	98	936.23	94	936.19	86	936.27	101
26	936.81	224	936.27	101	937.71	655	936.50	155	936.31	109	938.35	1040	937.08	342	937.29	425	936.25	98	936.23	94	936.21	90	936.23	94
27	937.00	310	936.35	118	937.98	820	936.64	191	937.08	342	937.83	750	937.06	334	936.96	246	936.06	56	936.00	88	936.23	94	936.27	101
28	937.33	455	936.37	123	938.71	1300	936.62	186	938.37	1060	937.71	655	937.12	358	936.96	246	936.06	56	936.27	101	936.23	94	936.27	101
29	937.25	415	936.31	109	938.19	945	936.67	200	939.75	2020	937.58	580	937.17	378	936.73	218	935.89	44	936.27	101	936.25	98	936.14	78
30	937.17	278	936.42	135	937.96	805	936.67	200	940.50	2550	937.37	475	938.37	1060	936.69	205	936.02	60	936.26	98	936.25	98	936.28	104
31	.....	.....	936.42	135	938.67	1270	.....	.....	940.50	2620	937.37	475	938.69	1280	.....	.....	936.31	109	926.25	98	.....	.....	936.29	105

Monthly Discharge of Speed River at Hespeler for 1915-6

Drainage Area, 250 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	455	105	203	1.82	.42	.81	.90
December “	358	101	154	1.43	.40	.62	.71
January (1916)	1,300	150	500	5.20	.60	2.00	2.31
February	2,190	155	336	8.76	.62	1.34	1.45
March	2,620	107	410	10.48	.43	1.64	1.89
April	2,080	334	906	8.32	1.34	3.62	4.04
May	1,280	326	428	5.12	1.30	1.71	1.97
June	1,470	205	517	5.88	.82	2.07	2.31
July	191	44	121	.76	.18	.48	.55
August	118	44	96	.47	.18	.38	.44
September	107	39	89	.43	.16	.36	.40
October	105	57	94	.42	.23	.38	.44
The year	2,620	39	320	10.48	.16	1.28	17.42

Whiteman's Creek near Burford

Location—At the first concrete bridge above the confluence of the creek with the Grand River, lot 14, concession 3, Township of Brantford, County of Brant.

Records Available—June 30, 1913, to August 31, 1916.

Drainage Area—154 square miles.

Gauge—Vertical steel staff 0 to 12 feet on the left abutment of bridge. Elevation of zero on the gauge is 690.00, which has remained unchanged since established.

Channel and Control—All the water passes between the two abutments. The river bed directly under the bridge is solid concrete. During flood conditions on the Grand River this section may be affected by backwater.

Discharge Measurements—Made from the bridge at all stages.

Winter Flow—Seriously affected by ice.

Regulation—A mill located 2 miles upstream known as App's Mill causes serious daily fluctuations in the river stage at this section.

Accuracy—The fluctuations caused by chopping mill make it difficult to obtain the representative mean daily gauge height. The rating curve is fairly well defined up to 700 second feet.

Observer—J. R. Davis, Brantford.

Gauge readings discontinued after August 31, 1916.

Discharge Measurements of Whiteman's Creek near Burford in 1915=6

Date	Hydrographer	Width in Feet	Area of Section in Sq. Feet	Mean Velocity in Feet per Sec.	Gauge Height in Feet	Discharge in Sec-Feet	Discharge in Second-feet per Square Mile
1915							
Nov. 4....	Cunnington, G ..	61	35	1.70	690.83	52	.....
1916							
May 2....	Yeates, W.....	60	69	2.49	691.33	171	.....

Monthly Discharge of Whiteman's Creek near Burford for 1915-6

Drainage Area 154 Square Miles

Month	Discharge in Second-feet			Discharge in Second-feet per Square Mile			Run-off
	Maximum	Minimum	Mean	Maximum	Minimum	Mean	Depth in Inches on Drainage Area
November (1915)	334	31	117	2.17	.20	.76	.85
December ..	251	56	101	1.63	.36	.66	.76
January (1916)	1,025	88	489	6.66	.57	3.18	3.67
February	860	164	267	5.58	1.06	1.73	1.86
March	1,660	88	312	10.78	.57	2.03	2.34
April	825	164	376	5.36	1.06	2.44	2.72
May	640	122	271	4.16	.79	1.76	2.03
June	685	88	284	4.45	.57	1.84	2.05
July	70	16	36	.45	.10	.23	.27
August	39	8	25	.25	.05	.16	.18
September	29	4	17	.19	.03	.11	.07
October .....	.....	.....	.....	.....	.....	.....	.....
The period	1,660	4	217	10.78	.03	.41	16.83

Gauge reading discontinued from November 1st, 1916.

Miscellaneous Measurements

River	Location	Date	Discharge in Sec.-ft.
Beaver	Feversham	Dec. 8, 1915....	22
“	“	Jan. 14, 1916....	39
“	“	Feb. 9, 1916....	76
“	“	Feb. 10, 1916....	78
“	“	Feb. 24, 1916....	54
Kabuskong	Bonfield	Nov. 4, 1915....	33
“	“	Dec. 21, 1915....	28
“	“	June 2, 1916....	139
“	“	July 7, 1916....	79
Rainy	Emo	May 30, 1916....	41,584
Snake Creek	Port Elgin	Nov. 23, 1915....	85
Sydenham	Florence	Nov. 11, 1915....	69
Winnipeg	Dalles Rapids	Aug. 30, 1916....	27,141
“	“	Sept. 4, 1916....	24,731
“	“	Sept. 9, 1916....	24,205
“	Throat Rapids	Sept. 8, 1916....	5,807
“	White Dog Falls	June 28, 1916....	40,746
“	White Dog Falls, S. Chan..	June 19, 1916....	35,674
“	White Dog Falls, N. Chan..	Sept. 30, 1916....	27,404

EASTERN ONTARIO DISTRICT

Summary of Discharge

Summary of discharge in second-foot per square mile for regular river stations in Eastern Ontario District for which such data are available in this report

Station	Drainage Area Sq. miles	1915		1916										
		Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Year.
Bonnechere River near Golden Lake.....	575	.24	.27	.34	.52	.59	2.80	3.57	1.62	.91	.48	.52	.43	1.02
Madawaska River at Madawaska.....	800	.36	.36	.46	.73	.53	2.92	2.48	.98	.55	.29	.26	.30	.85
Mississippi River at Ferguson's Falls.....	1,042	.40	.45	.67	1.11	.70	4.94	3.65	3.24	1.89	.57	.37	.36	1.52
Mississippi River at Galletta.....	1,456	.29	.35	.54	.89	.67	3.82	2.48	1.88	1.30	.44	.28	.27	1.10
Mississippi River near Snow Road.....	446	.57	.65	.81	.96	.91	4.89	3.84	3.73	2.36	.94	.64	.62	1.74
Moula River near Foxboro	1,038	.40	.48	1.11	1.92	.99	5.55	2.36	3.65	1.11	.25	.13	.10	1.48
Napanee River near Napanee	300	.39	.53	1.02	2.33	1.79	6.84	3.00	4.26	1.73	.24	.14	.16	1.86
Petawawa River near Petawawa	1,572	.....*	.39	.40	.48	.48	1.78	2.77	2.28	1.40	.63	.44	.46	1.08
Tay River near Glen Tay.....	204	.37	.48	.77	.75	1.74	2.50	2.44	3.69	1.78	.97	.73	.36	1.38
York River near Bancroft.....	374	.60	.66	.73	.92	2.01	3.80	2.67	1.45	.74	.64	.58	.44	1.27

*December 15-31.

NORTHERN ONTARIO DISTRICT

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations in the Northern Ontario District for which such data are available in this report.

Station	Drainage Area Sq. miles	1915		1916										
		Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Year.
Aux Sables River near Massey.....	524	1.34	1.16	.69	.76	.69	4.68	3.49	4.14	1.87	.32	.39	1.40	1.74
Blanche River near Englehart.....	430	.90	1.59	.50	.44	.64	5.86	3.12	.73	.60	.57	.50	.66	1.34
Frederickhouse River at Frederickhouse.....	1,260	1.72	1.38	1.63	1.68	1.42	2.85	6.75	1.66	1.19	.46	.26	.35	1.78
Kagawong River at Kagawong.....	94	.24	.26	.48	.57	.79	2.51	2.20	1.07	.66	.36	.34	.28	.81
Magnetawan River (No. Branch) near Burk's Falls	107	1.55	1.77	1.78	2.64	1.38	8.03	4.81	3.23	.90	.28	.65	2.10	2.42
Magnetawan River (So. Branch) near Burk's Falls	257	1.18	1.35	1.48	2.16	1.32	5.37	4.56	2.92	1.42	.58	.67	1.21	2.01
Mississagi River at Iron Bridge.....	3,565	*1.85	1.83	.95	.63	.51	2.31	2.53	2.01	1.21	.48	.53	1.07	1.30
Muskoka River (North Branch) near Port Sydney	560	1.14	1.22	1.42	1.97	1.02	5.72	3.12	1.78	.58	.35	.24	.99	1.62
Muskoka River (So. Branch) at Tretheway's Falls.	668	.86	.94	1.18	2.10	1.65	4.66	4.49	3.21	1.23	.64	.57	.60	1.84
Seguin River near Parry Sound.....	380	2.26	1.71	1.36	2.64	1.00	6.24	5.78	1.78	.72	.47	.72	.99	2.13
South River near Powassan.....	294	1.00	.84	1.30	1.14	1.41	7.43	3.34	1.48	.55	.30	.78	1.72	1.77
Spanish River at Espanola.....	4,490	1.07	1.36	.86	.57	.69	4.42	3.39	1.97	1.04	.62	.56	.68	1.43
Sturgeon River near Smoky Falls.....	2,250	.93	1.25	.75	.87	1.00	4.07	4.54	2.01	1.05	.70	.46	.81	1.53
Vermilion River near Whitefish.....	1,580	1.00	1.15	.68	.60	.44	5.71	3.44	1.84	1.16	.15	.11	.22	1.37
Wanapitei River near Wanapitei.....	940	.78	.76	.75	.68	.69	1.39	4.90	2.08	1.90	1.04	.51	.....	1.41

*November 15-30.

NORTH-WESTERN ONTARIO DISTRICT

Summary of Discharge

Summary of discharge in second-feet per square mile for regular river stations in the North-Western Ontario District for which such data are available in this report

Station	Drainage Area Sq. miles	1915		1916											
		Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Year.	
Eagle River at Eagle River.....	970	.30	.33	.37	.39	.35	.48	1.65	1.99	1.31	1.02	.84	.75	.82	
English River at Ear Falls.....	11,700	.62	.70	.64	.56	.47	.46	.82	1.55	1.70	1.49	1.09	.78	.93	
English River at Manitou Falls.....	14,600	.58	.65	.60	.53	.44	.43	.74	1.37	1.43	1.31	.97	.70	.84	
English River at Oak Falls.....	15,570	.59	.64	.60	.53	.45	.49	.75	1.38	1.52	1.33	.96	.71	.85	
Footprint River at Rainy Lake Falls.....	590	.14	.14	.14	.14	.16	.39	1.81	1.80	1.01	.55	.36	.23	.57	

SOUTH-WESTERN ONTARIO DISTRICT

Summary of Discharge

Summary of discharge in second feet per square mile for regular river stations in South-Western Ontario District for which such data are available in this report.

Station	Drainage Area Sq. miles	1915		1916										
		Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Year.
Ansable River near Arkona	408	.67	1.29	4.65	.91	2.38	2.45	2.53	1.03	.10	.08	.05	.09	1.36
Beaver River near Kimberley	100	.70	.73	2.58	2.63	2.06	3.30	1.91	1.29	.58	.45	.39	.51	1.42
Bighead River at Meaford	132	.94	1.11	1.38	1.52	1.77	2.21	1.20	1.11	.48	.35	.26	.48	1.06
Black River near Washago	585	.69	.86	1.43	2.46	1.60	6.64	3.15	1.26	.42	.16	.08	.48	1.59
Credit River at Cataract Junction	85	.69	.61	1.73	1.54	1.82	3.13	.91	.81	.36	.26	.22	.38	1.04
Maitland River at Ben Miller	950	1.21	1.84	4.36	1.53	2.93	4.54	1.66	1.07	.19	.11	.10	.16	1.64
Nottawasaga River near Nicolston	416	.59	.55	1.63	1.05	1.74	3.49	1.10	.92	.27	.16	.18	.34	1.00
Rocky Saugeen River near Markdale	96	.80	1.00	2.17	2.35	1.24	3.58	2.06	1.69	.92	.65	.60	.61	1.47
Saugeen River near Port Elgin	1,565	.90	1.22	3.26	3.13	2.70	4.94	1.74	1.27	.44	.29	.26	.38	1.49
Saugeen River near Walkerton	850	.94	.96	2.88	1.54	1.49	5.23	1.92	1.45	.51	.33	.29	.39	1.39
Sydenham River near Owen Sound	71	.87	.82	3.08	1.41	1.75	3.58	1.89	1.89	.55	.32	.27	.38	1.39
Thames River (Main Stream) near Byron	1,270	1.05	.95	5.78	1.01	2.10	2.71	2.63	1.58	.22	.10	.09	.16	1.53
Thames River (South Branch) near Ealing	515	.91	1.10	4.16	1.40	2.33	2.39	2.35	1.81	.28	.24	.14	.22	1.45
Thames River (North Branch) near Fanshawe	650	1.05	1.33	5.45	.83	1.66	2.75	1.42	1.42	.19	.04	.03	.05	1.36

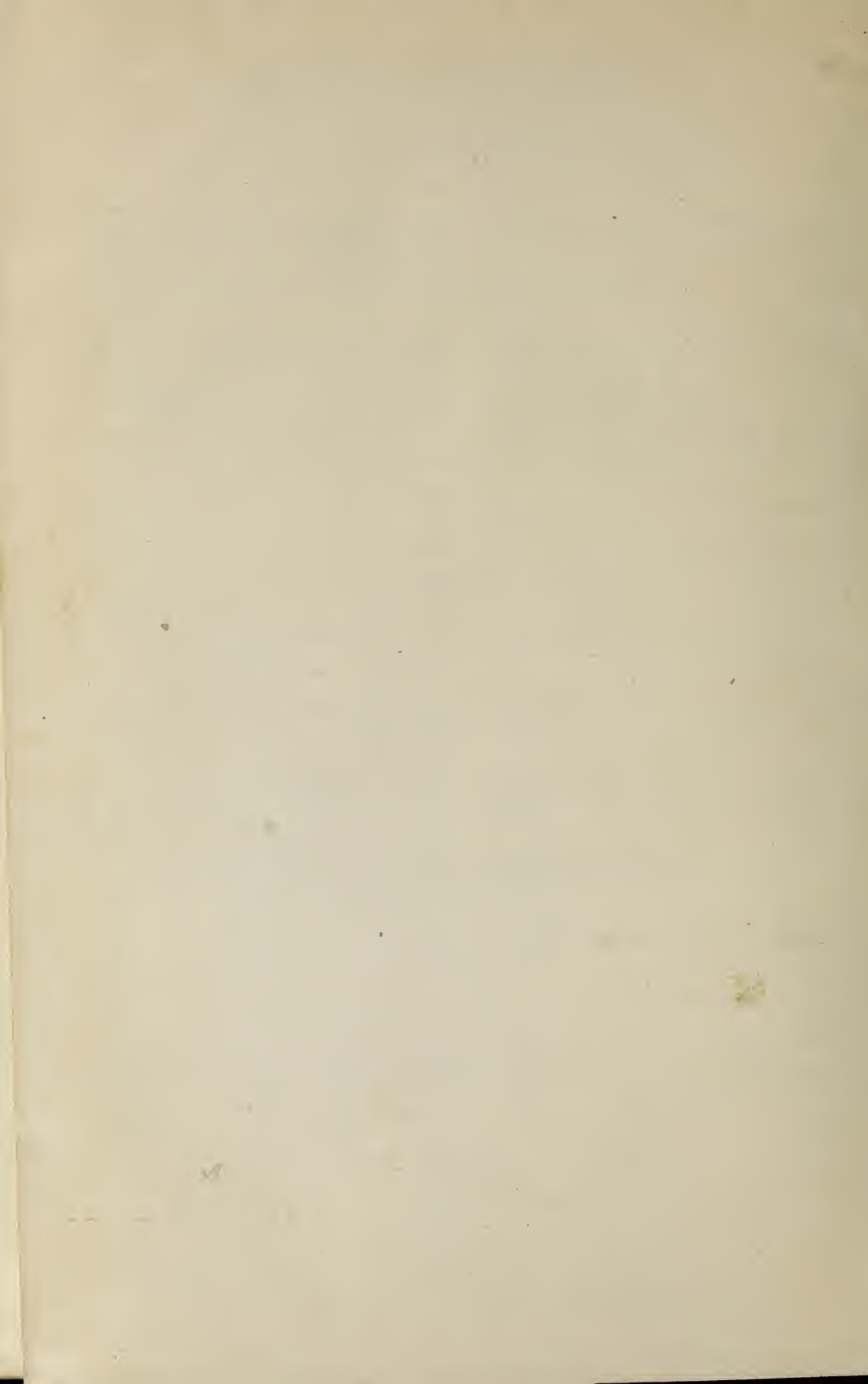
SOUTH-WESTERN ONTARIO DISTRICT
GRAND RIVER BASIN
Summary of Discharge

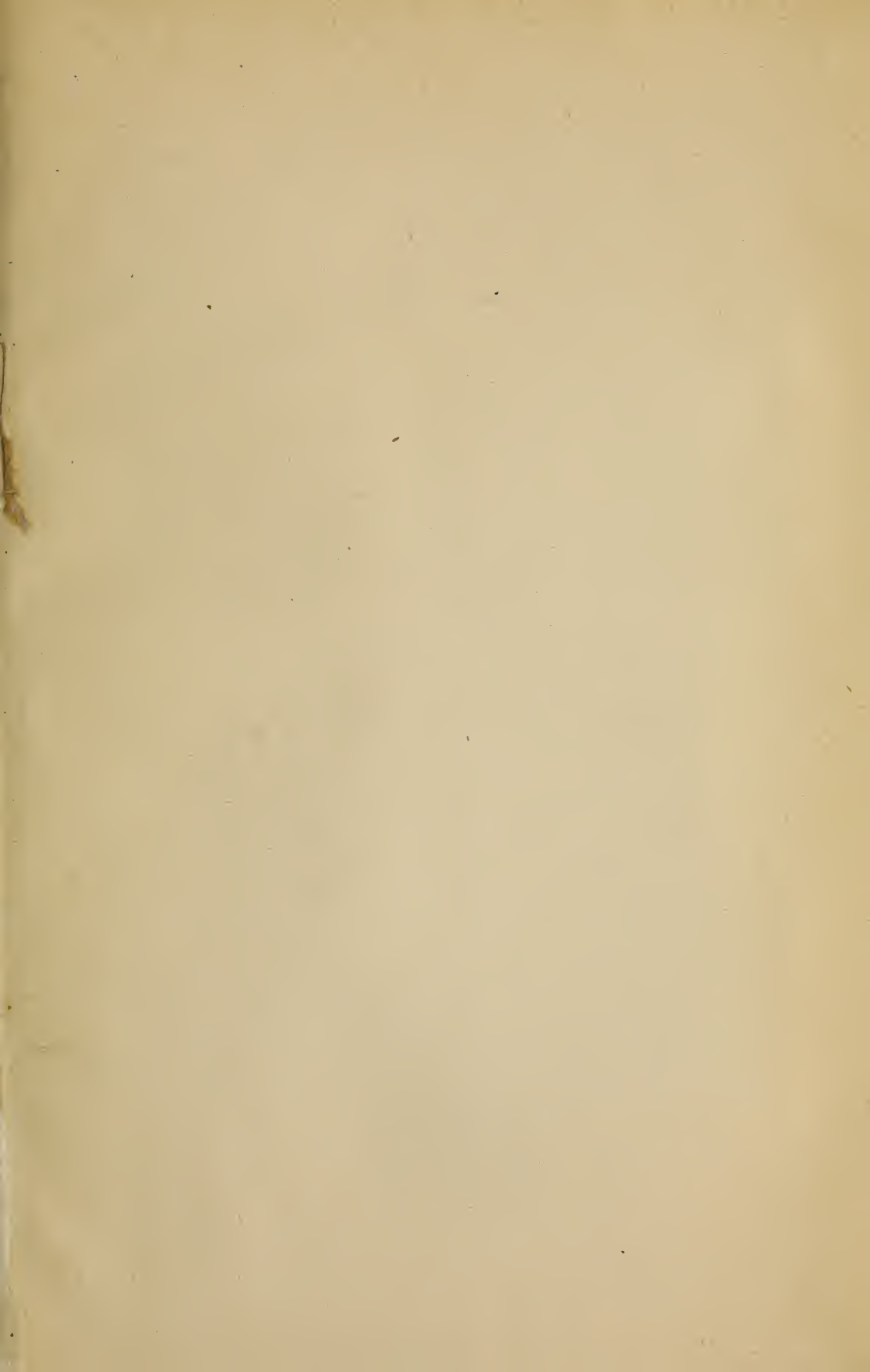
Summary of discharge in second-feet per square mile for regular river stations on Grand River and tributaries for which such data are available in this report

Station	Drainage Area Sq. miles	1915				1916								
		Nov.	Dec.	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Year
Grand River at Belwood	280	.86	.57	4.06	.95	1.86	6.20	1.03	.62	.04	.01	.01	.03	1.35
Grand River near Conestogo.....	550	.98	.57	3.15	.75	1.76	4.90	1.33	1.47	.14	.05	.04	.08	1.26
Grand River at Galt.....	1,360	.77	.47	2.23	.70	1.59	3.52	1.25	1.51	.19	.10	.09	.17	1.05
Grand River at Glen Morris	1,390	1.15	.52	2.38	1.08	1.67	3.82	1.61	1.77	.35	.25	.24	.33	1.26
Grand River at Brantford.....	2,000	.82	.57	3.17	.96	1.53	3.21	1.64	1.69	.32	.22	.15	.25	1.21
Grand River at York.....	2,280	.73	.80	3.32	1.39	1.94	3.67	1.74	1.78	.30	.16	.14	.24	1.35
Irvine River near Salem	67	.81	.22	5.67	.75	4.43	8.36	1.28	3.18	.09	.03	.....	.....	2.48
Conestogo River at St. Jacob's.....	305	1.11	.48	4.52	.73	2.40	4.91	.77	1.55	.16	.02	.....	.....	1.66
Speed River near Guelph	77	.86	.51	2.55	1.61	3.68	3.83	1.88	1.51	.22	.09	.06	.27	1.42
Speed River at Hespeler.....	250	.81	.62	2.00	1.34	1.64	3.62	1.71	2.07	.48	.38	.36	.38	1.28
Galt Creek at Galt	45	.60	.51	1.91	1.80	1.42	2.29	1.58	1.22	.36	.27	.....	.....	1.20
Nith River near Canning.....	365	1.14	.74	3.39	1.56	2.95	3.15	2.19	1.87	.36	.28	.25	.34	1.52
Whiteman's Creek near Burford.....	154	.76	.66	3.18	1.73	2.03	2.44	1.76	1.84	.23	.16	.11	.....	1.41
Fairchild's Creek near Onondaga	115	.45	.36	7.07	1.81	3.30	4.53	2.33	1.09	.17	.11	.....	.....	2.12
Boston Creek near York	125	.37	.40	3.22	1.29	1.92	2.46	1.45	1.87	.13	.06	.....	.....	1.31

INDEX

	PAGE		PAGE
Almonte Construction	5	Miscellaneous Measurements	207
Ausable River	117-119	Mississagi River	61-63
Aux Sables River	43-45	Mississippi River	18-26
Beaver River	120-122	Moirs River	27-29
Bighead River	123-125	Muskoka River	64-69
Black River	126-128	Napanee River	30-32
Blanche River	46-48	Niagara Power Development	2
Bonnechere River	9-13	Nipissing Power Company	2
Boston Creek	180-182	Nith River	195-197
Cobden Construction	4	Northern Ontario Metering Sections..	42
Conestogo River	183-185	Northwestern Ontario Metering Sec-	
Credit River	129-131	tions	89
Crown Leases	2	Nottawasaga River	135-137
Discharge Summary	208-212	Petawawa River	33-35
Eagle River	90-92	Power Construction	3
Eastern Ontario Metering Sections ...	8	Rocky Saugeen River	138-140
English River—		Saugeen River	141-147
Caribou Falls	93	Seguin River	70-72
Ear Falls	94-96	Seine River	109-110
Manitou Falls	98-100	South Falls Construction	3
Oak Falls	101-103	South River	73-75
Sturgeon Falls	104	Southwestern Ontario Metering Sec-	
Fairchild's Creek	186-188	tions	116
Footprint River	105-107	Grand River Metering Sections	160
Frederickhouse River	49-51	Spanish River	76-78
Galt Creek	189-191	Speed River	198-203
Grand River—		Sturgeon River	79-81
Belwood	161-163	Summary of Discharge—	
Brantford	164-167	Eastern Ontario	208
Conestogo	168-170	Northern Ontario	209
Galt	171-173	Northwestern Ontario	210
Glen Morris	174-176	Southwestern Ontario	211
York	177-179	Southwestern Ontario, Grand River	
Irvine River	192-194	Basin	212
Kagawong River	52-54	Sydenham River	148-150
Lac Seul	2	Tay River	36-38
Madawaska River	14-17	Thames River	151-159
Maganetawan River	55-60	Turtle River	111-112
Maitland River	132-134	Vermilion River	82-84
Manitou River	108	Wabigoon River	113-115
Measurement of Stream Flow	1	Wanapitei River	85-88
		Whiteman's Creek	204-206
		York River	39-41





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